

Service Manual



The photo shows the model KE-4242/UC.

**ORDER NO.
CRT 1095**

CASSETTE CAR STEREO WITH FM/AM ELECTRONIC TUNER

KE-4242 UC

KE-4515 US

NOTE: This service manual is designed to be used together with Model KE-3232/UC Service Manual (CRT1090).
Refer to it for finding parts numbers and circuit description, etc. which are not shown in this manual.

SPECIFICATIONS

General

Power source 14.4 V DC (10.8 — 15.6 V allowable)
Grounding system Negative type
Max. current consumption 2.5 A
Dimensions (chassis) 170(W) × 50(H) × 130(D) mm
[6-3/4(W) × 2(H) × 5-1/8(D) in.]
(nose) 105(W) × 42(H) × 36(D) mm
[4-1/8(W) × 1-5/8(H) × 1-3/8(D) in.]
Shaft interval 130 or 147 mm (5-1/8 or 5-3/4 in.)
Weight 1.5 kg (3.3 lbs.)

Amplifier

Continuous power output is 3.2 W per channel min. into 4 ohms, both channels driven 50 to 15,000 Hz with no more than 5% THD.
Maximum power output 8.5 W × 2/7 W × 4 (EIAJ)
Load impedance 4 Ω (4 — 8 Ω allowable)
Maximum output level/output impedance (RCA) 500 mV/100 Ω
Tone controls (bass) ±10 dB (100 Hz)
(treble) ±10 dB (10 kHz)
Loudness contour +8 dB (100 Hz) (volume: -30 dB)

Tape player

Tape Compact cassette tape (C-30 — C-90)
Tape speed 4.76 cm/sec. (+0.14 cm/sec., -0.05 cm/sec.)
Fast forward/rewind time Approx. 100 sec. for C-60
Wow & flutter 0.13% (WRMS)
Frequency response Metal: 50 — 17,000 Hz (±3 dB)
Normal: 50 — 14,000 Hz (±3 dB)
Stereo separation 45 dB
Signal-to-noise ratio 52 dB (IHF-A network)

FM tuner

Frequency range 87.9 — 107.9 MHz
Usable sensitivity 12 dBf (1.1 μV/75Ω, mono)
50 dB quieting sensitivity 17 dBf (1.9 μV/75Ω, mono)
Signal-to-noise ratio 70 dB (IHF-A network)
Distortion 0.3% (at 65 dBf, 1 kHz, stereo)
Frequency response 50 — 15,000 Hz (±3 dB)
Stereo separation 40 dB (at 65 dBf, 1 kHz)
Selectivity 70 dB (2 ACA)

AM tuner

Frequency range 530 — 1,620 kHz
Usable sensitivity 18 μV (25 dB) (S/N: 20 dB)
Selectivity 50 dB (±10 kHz)

These specifications were determined and are presented in accordance with specification standards established by the Ad Hoc Committee of Car Stereo Manufacturers.

Note:

Specifications and the design are subject to possible modifications without notice due to improvements.

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1710

ADJUSTMENT

HEAD AZIMUTH ADJUSTMENT

- Connection Diagram

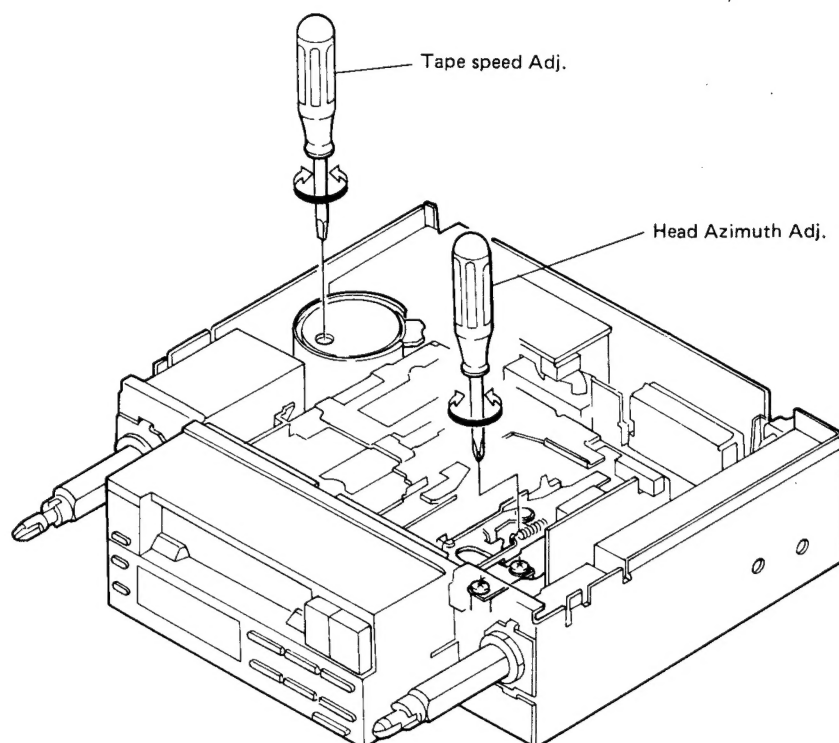


Fig. 1

- To Adjust

1. Play "A" side of STD-341A (10kHz, -20dB). Adjust each screw for maximum output in forward and reverse directions.
2. Play "B" side in forward and reverse directions to confirm adjustment.

TAPE SPEED ADJUSTMENT

- Connection Diagram (shown in Fig. 1)

- To adjust

1. Reproduce STD-301 (3kHz, -10dB). Adjust the semi-fixed resistor so that the frequency counter shows 3,010Hz (+30Hz, -30Hz).

FM IF ADJUSTMENT

● Connection Diagram

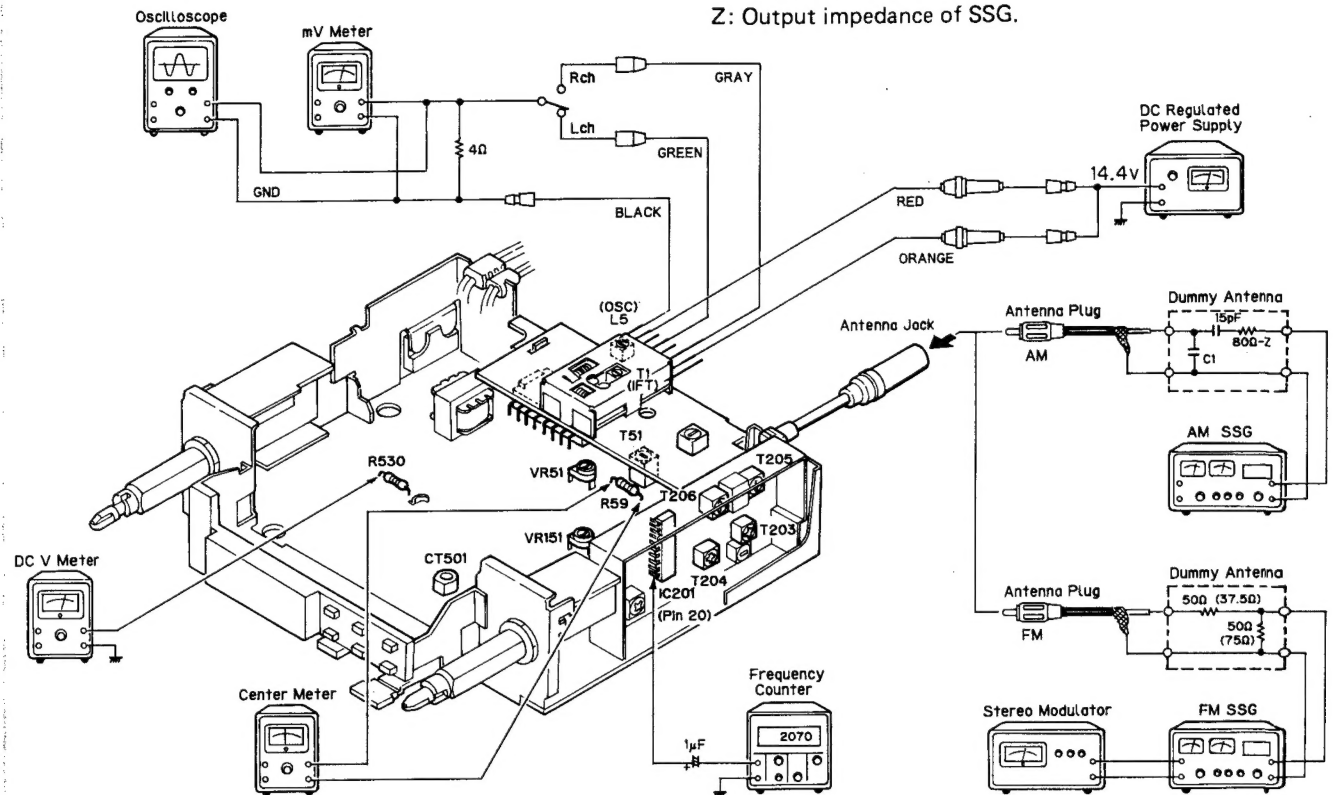


Fig. 2

● To Adjust

1. Apply a signal of 98.1MHz, 400Hz, 100% modulation and 60dB (μ V) from the FM SSG and tune 98.1MHz.
2. Adjust T51 to make the center meter show 0.

AUTO LEVEL ADJUSTMENT

● Connection Diagram (shown in Fig. 2)

● To Adjust

1. Set SSG at 98.1MHz and tune using the tuning button.
2. Set SSG to an output level of 35 dB (μ V), and adjust VR151 to a separation of 5 dB (between the right and left channels).

NOTICE:

Select C1 so that total capacity of 80pF is attained from the direction of the receiver jack.

Z: Output impedance of SSG.

FM SCAN SENSITIVITY

● Connection Diagram (shown in Fig. 2)

● To Adjust

1. Turn off the Local Station Seek switch.
2. Add a 98.1MHz (400Hz, 100% modulation) output level 25dB (μ V) signal from the SSG.
3. Push the SEEK button, and adjust VR51 so that the SEEK stops.
4. Set the SSG output level to 14dB (μ V). And check to make sure that the SEEK doesn't stop.
5. Push the Local Station Seek switch and set it to Local Station.
6. Check to make sure that the SEEK stops when the SSG output level is 47 ± 10 dB (μ V).
7. If it is not within specifications, repeat the procedure starting at step one.

AM (MW) TRACKING ADJUSTMENT

- Connection Diagram (shown in Fig. 2)

- To Adjust

Frequency of AM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	1,620 kHz	For Confirmation only	Less than 7.4V	
2.	530 kHz	For Confirmation only	More than 0.7V	
3. 600 kHz (400 Hz, 30% modulation) output level 25 dB (μ V)	600 kHz	T203, T204 T205, T206		Maximum output
600 kHz 4. 1,000 kHz (400 Hz, 30% modulation) 1,400 kHz output level 35 dB (μ V)	600 kHz 1,000 kHz 1,400 kHz	For Confirmation Only		The difference between the maximum and minimum output levels at 600 kHz, 1,000 kHz, and 1,400 kHz must be 6 dB or less.

FM TRACKING ADJUSTMENT

- Connection Diagram (shown in Fig. 2)

- To Adjust

Frequency of FM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	107.9 MHz	L5	Less than 7.4V	
2.	87.9 MHz	For confirmation only	More than 1.6V	
3. 98.1 MHz (400 Hz, 100% modulation) output level 5 ~ 10 dB (μ V)	98.1 MHz	T1		Maximum output

REFERENCE OSCILLATION FREQUENCY ADJUSTMENT

- Connection Diagram (shown in Fig. 2)

- To Adjust

1. Set the AM position.
2. Set the LCD display to 1620KHz.
3. Adjust CT501 so that the frequency counter display becomes 2070kHz \pm 40Hz.

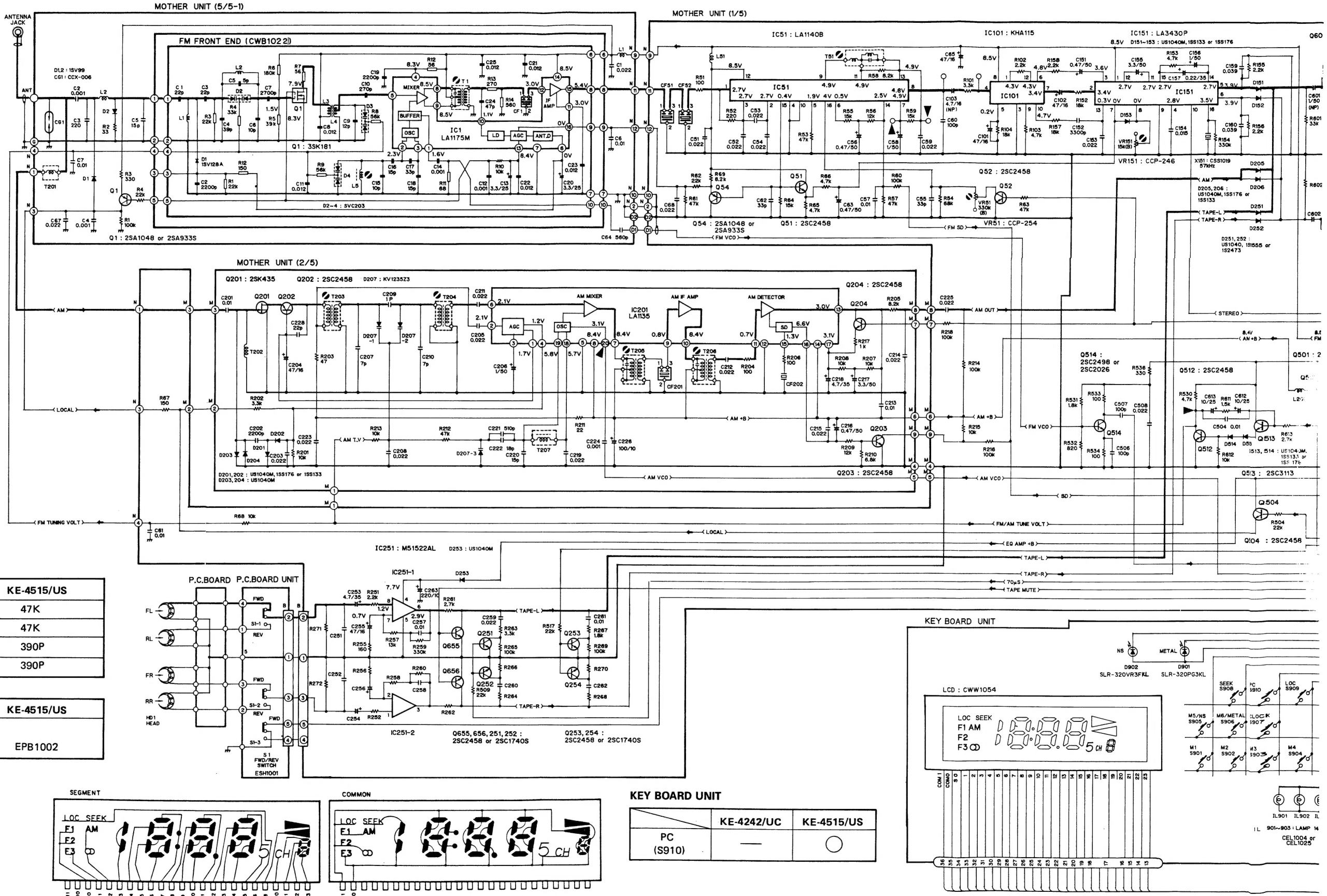
SCHEMATIC CIRCUIT DIAGRAM

A

B

C

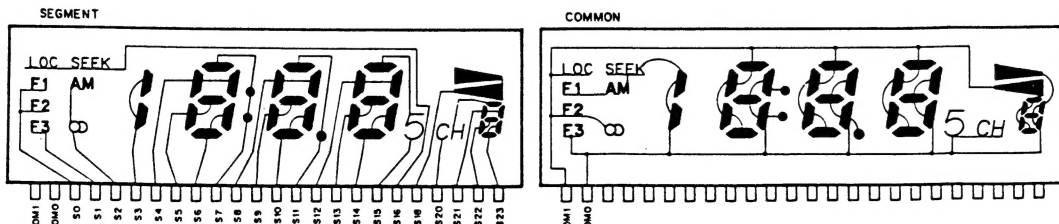
D



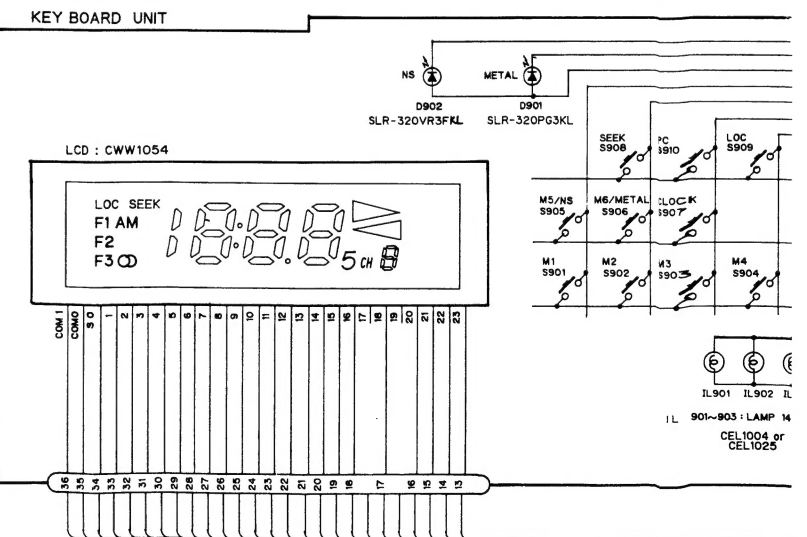
MOTHER UNIT (1/5)

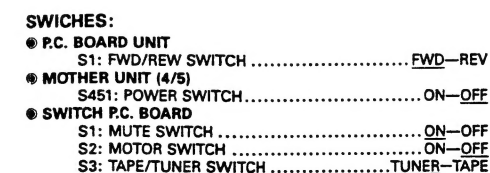
	KE-4242/UC	KE-4515/US
R271	—	47K
R272	—	47K
C251	470P	390P
C252	470P	390P

	KE-4242/UC	KE-4515/US
HDI	EPB1001	EPB1002



	KE-4242/UC	KE-4515/US
PC (S910)	—	○

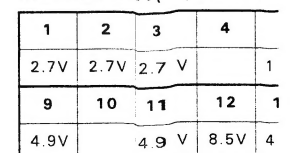




The underlined indicates the switch position.

Fig 3

6



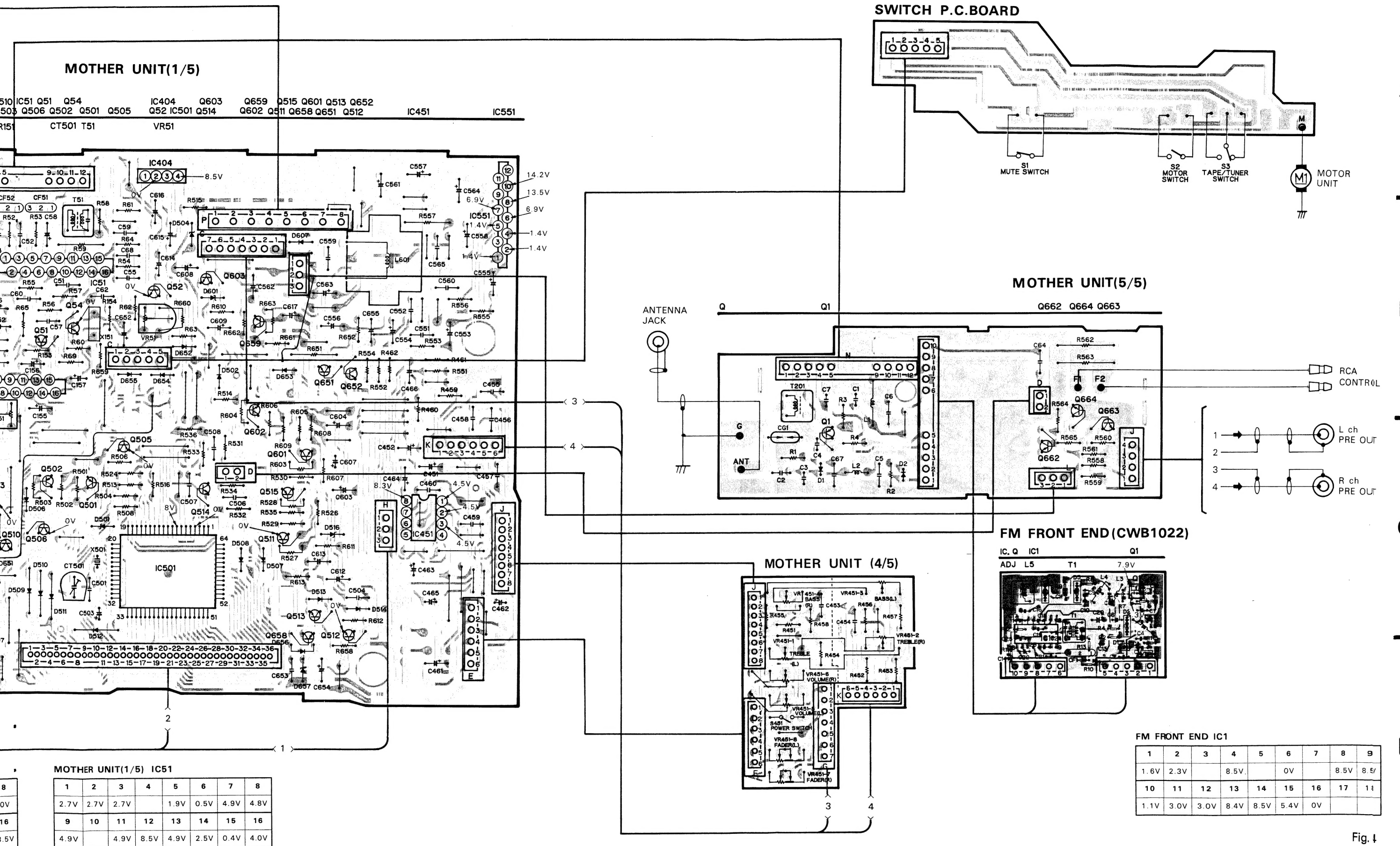
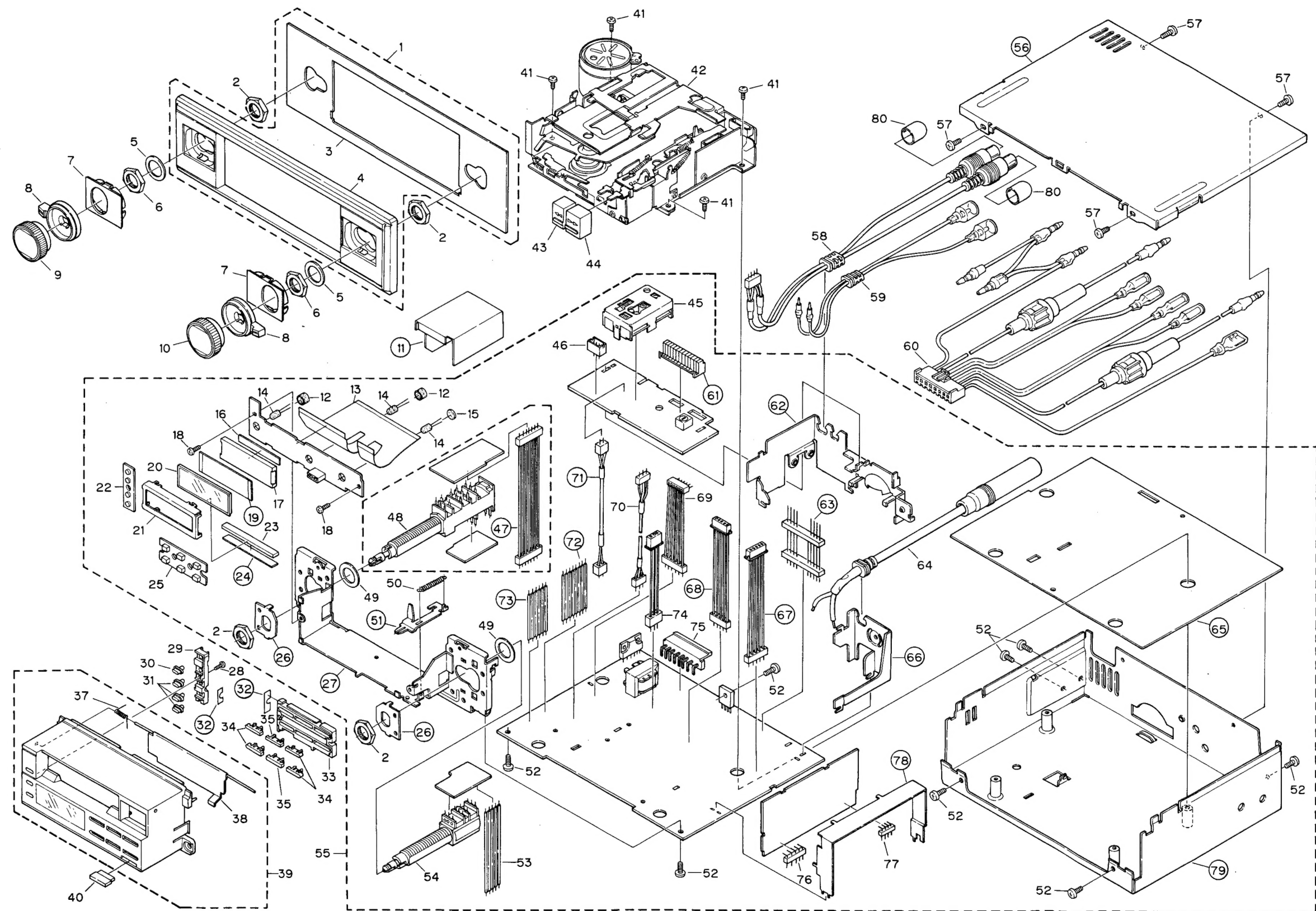


Fig. 1

EXPLODED VIEW



● Part List

NOTE:

- For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.
- ★★: GENERALLY MOVES FASTER THAN ★.
- This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- Parts whose parts numbers are omitted are subject to being not supplied.
- Parts marked by “●” are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

A

B

C

D

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	CXA1629	Panel Assy	●	42.	EXK1130	Cassette Mechanism Assy (KE-4242/UC)
	2.	CBN-028	Nut			EXK1150	Cassette Mechanism Assy (KE-4515/US)
	3.	CNG-633	Plate				
	4.	CNS1226	Panel				
	5.	CND-646	Spacer	★	43.	CAC1277	Button
	6.	CBN-028	Nut	★	44.	CAC1276	Button
	7.	CNK-292	Cap		45.	CWB1022	FM Front End
★	8.	CAA1054	Knob (KE-4242/UC)		46.	CKS-567	Plug (3P)
		CAA1058	Knob (KE-4515/US)		47.		Connector
★	9.	CAA1011	Knob	★★	48.	CCS1038	Volume/Switch
★	10.	CAA1055	Knob		39.	CBE-084	Spacer
	11.		Insulator		50.	CBH1084	Spring
	12.	CNV1088	Bush		51.		Lever
	13.	CNP1296	P.C. Board		52.	BMZ30P060FMC	Screw
★★	14.	CEL1004 or	Lamp, 14V 40mA		53.	CDE1409	Connector
		CEL1025		★★	54.	CSD1001	Volume/Switch
	15.	CNV1102	Bush		55.	CWM1350	Tuner Amp Assy (KE-4242/UC)
	16.	CNN-137	Spacer			CWM1351	Tuner Amp Assy (KE-4515/US)
	17.	CNY-215	Lens		56.		Case
	18.	PMZ20P050FMC	Screw		57.	BMZ30P040FMC	Screw
	19.		Plate		58.	CDE1126	Connector
	20.	CWW1054	LCD		59.	CDE1381	Cord
	21.	CNH-136	Holder		60.	CDE1419	Cord Assy
	22.	CNV1375	Rubber		16.		Connector
	23.	CNY-214	Connector		62.		Heat Sink
	24.		Insulator		63.		Plug (8P)
	25.	CNV1299	Rubber		64.	CDH1061	Antenna Cable
	26.		Holder		65.		Insulator
	27.		Frame Unit		66.		Holder
	28.	PTZ14P045FZK	Screw		67.		Connector (5P)
	29.	CNV1298	Lens		68.		Connector (5P)
★	30.	CAC1281	Button (KE-4515/US)		69.	CDE1412	Connector (6P)
★	31.	CAC1281	Button		70.	CDK-206	Connector (3P)
	32.		Plate		71.		Connector (2P)
	33.	CNV1297	Lens		72.		Connector (8P)
	34.	CAC1279	Button		73.		Connector (6P)
★	35.	CAC1280	Button		74.	CDE1410	Connector (3P)
	36.	VACANT			75.	CKS-465	Plug (8P)
	37.	CBH1033	Spring		76.	CKS-128	Plug (5P)
	38.	CAT1056	Door (KE-4242/UC)		77.	CKS-127	Plug (4P)
		CAT1057	Door (KE-4515/US)		78.		Holder
	39.	CXA1587	Grille Unit (KE-4242/US)		79.		Chassis Unit
		CXA1588	Grille Unit (KE-4515/US)		80.	CNW-829	Cap
★	40.	CAC1278	Button				
	41.	BMZ26P050FMC	Screw				

ELECTRICAL PARTS LIST

NOTE:

When ordering resistors, first convert resistance values into code form as shown in the following examples.

- Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).
- | | | | |
|------|----------------------|----------|-----------------|
| 560Ω | 56 × 10 ¹ | 561..... | RD1/4PS 5 6 1 J |
| 47kΩ | 47 × 10 ³ | 473..... | RD1/4PS 4 7 3 J |
| 0.5Ω | 0R5..... | | RN2H 0 5 K |
| 1Ω | 010..... | | RS1P 0 1 0 K |

- Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).
- | | | |
|--------|-----------------------------|-----------------|
| 5.62kΩ | 562 × 10 ¹ | RN1/4SR 5 6 2 F |
|--------|-----------------------------|-----------------|

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- Parts whose parts numbers are omitted are subject to being not supplied.

MOTHER UNIT
MISCELLANEOUS

Mark	Symbol & Description	Part No.	Mark	Symbol & Description	Part No.
★★	IC51	LA1140B	★	D207	KV1235Z3
★★	IC101	KHA115	★	D251, 252, 503, 509 – 512	US1040 or
★★	IC151	LA3430P			1S1555 or
★★	IC201	LA1135			1S2473
★★	IC251	M51522AL	★	D501	RD4R7ESB1 or
★★	IC404	AN6540			MTZ4R7JA
★★	IC451	TA75558P	★	D504	HZS5R6JB2 or
★★	IC501	PD4073B			RD5R6JSB2
★★	IC551	TA7280P	★	D516	RD6R8ESB2
★★	Q1, 54, 515, 658, 662	2SA1048 or 2SA933S	★	D601	MTZ9R1JA or
★★	Q51, 52, 202 – 204	2SC2458	★	D607	RD9R1ESB1
★★	Q201	2SK435	★	D657	ERA15-02VH
★★	Q251 – 254	2SC2458 or 2SC1740S			MTZ9R1JC or
		2SA1150	L1	Ferri-Inductor	RD9R1ESB3
★★	Q501, 502				CTF-156
			L2	Ferri-Inductor	CTF1038
★★	Q503, 510	UN4216	L51	Ferri-Inductor	CTF-155
★★	Q504 – 506, 509, 511, 512, 516	2SC2458	L201	Ferri-Inductor	CTF-157
★★	Q513	2SC3113	L601	Coil	CTF-002
★★	Q514	2SC2498 or 2SC2026	T51	Coil	CTC-198
★★	Q601, 602, 655, 656, 659	2SC2458 or 2SC1740S	T201	Coil	CTB1011
		2SC2060 or 2SD667	T202	Coil	CTB1012
★★	Q603	2SD1468S	T203, 204	Coil	CTB1013
			T205	Coil	CTE1011
★★	Q651, 652		T206	Coil	CTE1012
★★	Q663, 664	2SD1468S	T207	Coil	CTB1014
★	D151 – 153, 201, 202, 205, 206, 253, 502, 506 – 508, 513, 514, 651 – 656	US1040M or 1SS176 or 1SS133	CF51, 52	Ceramic Filter	CTF-182
★	D203, 204, 253	US1040M	CF201	Filter	CTF-240
			CF202	Ceramic Resonator	CTF-247
			★★ VR51	Semi-fixed, 330kΩ (B)	CCP-254

Mark	Symbol & Description	Part No.	Mark	Symbol & Description	Part No.
★ ★	VR151 Semi-fixed, 15kΩ (B)	CCP-246		C209	CCPCH010M50L
★ ★	VR451/S451 Volume/Switch	CCS1038		C217	CEA3R3M50L2
	(TREBLE, BASS, FADER/ POWER)			C218	CEA4R7M35L2
				C220	CCDCH150J50L
				C221	CQPA511G2A
	CG1	CCX-006			
	CT501 Trimmer, 20P	CCG-070		C222	CCCRH180J50
	X151 Ceramic Resonator, 57kHz	CSS1019		C224	CKPYB102K50L
	X501 X'tal, 4.5MHz	CSS-046		C226	CEA101M10L2
★ ★	S601/VR601 Switch/Volume	CSD1001		C228	CCDSL220J50L
	(BAND, MEMO/TONE, BALANCE)			C251, 252 (KE-4242/UC)	CKPYB471K50L

RESISTORS

Mark	Symbol & Description	Part No.
	R51 – 58, 60 – 69, 101 – 104, 152 – 158, 201 – 218, 251, 252, 255 – 270, 451 – 462, 501 – 506, 508, – 520, 522, 524 – 537, 551 – 556, 558 – 561, 564, 565,	RD1/4PS□□□JL
	601 – 613, 652, 655, 658 – 663	
	R59, 507, 523, 557, 651, 656	RD1/4PM□□□J
	R562, 563	RS1P□□□JL
	R271, 272 (KE-4515/US)	RD1/4PS □□□JL

CAPACITORS

Mark	Symbol & Description	Part No.
	C1, 51 — 54, 59, 67, 68, 153, 203	CGCYX223K25
	C2	CCDPH390J50
	C3, 228	CCDSL220J50L
	C4	CKDBC102K25
	C5	CCL-068
	C55, 62	CCCSL330J50
	C6, 7, 57, 61, 201, 213	CGCYX103K25
	C56, 63, 151, 216	CEAR47M50LS2
	C58, 156, 616	CEA010M50LS2
	C60	CKPYB101K50L
	C64	CKCYB561K50
	C65, 204	CEA470M16L2
	C101, 102, 255, 256	CEA470M16LS
	C103	CEA4R7M16NPLL
	C152	CGCYX332K25
	C154	CKDBC153K25
	C155	CEA3R3M50LS
	C157	CSZAR22M35
	C159, 160	CKDBC393K25
	C161	CEA220M16L2
	C202	CGCYX222K25
	C205, 208, 211, 212, 214, 215, 219, 223, 225	CGCYX223K25
	C206, 614	CEA010M50LS2
	C207, 210	CCDSH070D50

Mark	Symbol & Description	Part No.
	C209	CCPCH010M50L
	C217	CEA3R3M50L2
	C218	CEA4R7M35L2
	C220	CCDCH150J50L
	C221	CQPA511G2A
	C222	CCCRH180J50
	C224	CKPYB102K50L
	C226	CEA101M10L2
	C228	CCDSL220J50L
	C251, 252 (KE-4242/UC)	CKPYB471K50L
	C251, 252 (KE-4515/US)	CKPYB391K50L
	C253, 254	CEANL4R7M35LL
	C255, 256	CEA470M16LS
	C257, 258, 261, 262	CGCYX103K25
	C259, 260	CGCYX223K25
	C263	CEA221M10L2
	C451, 452	CEA100M25LS
	C453 – 456	CQMA182K50LL
	C457, 458	CQMA333J50L
	C459, 460	CCPSL330J50L
	C461, 464	CEA010M50LS2
	C462, 463	CEA010M50L2
	C465	CEAR47M50L2
	C466	CEAR47M50LS2
	C501	CCCCH090D50
	C503	CEA331M6R3L2
	C504, 653	CGCYX103K25
	C506, 507	CKPYB101K50L
	C508	CKDBC223K25
	C551, 552	CKDYB331K50
	C553, 554	CEA010M50LS2
	C555, 556, 563	CEA470M16L2
	C557, 558	CEA101M10L2
	C559, 560	CQMA224J50L
	C561, 562	CEA102M10L2
	C564	CEA222M16L2
	C565	CQMA154J50L
	C601, 602	CEA010M50NPLL
	C603, 604	CEA100M25LS
	C607	CEA221M10L2
	C608, 609	CEA101M10L2
	C612, 613	CEA100M25LS
	C615	CEA470M16L2
	C617	CEA101M50L2
	C651	CEA100M25LS
	C652	CEA330M16LS
	C654	CEA470M16LS
	C655	CEAR224M50LS2

KEY BOARD UNIT

Mark	Symbol & Description	Part No.
★	LCD	CWW1054
★	D901 LED (METAL)	SLR-320PG3KL
★	D902 LED(NS)	SLR-320VR3FKL
★★	IL901 – 903 Lamp, 14V 40mA	CEL1004 or CEL1025

SWITCH P.C. BOARD

Mark	Symbol & Description	Part No.
★★	S1, 2 Switch (MUTE, MOTOR)	ESN1001
★★	S3 Switch (TAPE/TUNER)	HSK-126

P.C. BOARD UNIT

Mark	Symbol & Description	Part No.
★★	S1 Switch (FWD/REV)	ESH1001

Miscellaneous Parts List

Mark	Symbol & Description	Part No.
★★	HD1 Head (KE-4242/UC)	EPB1001
★★	HD1 Head (KE-4515/US)	EPB1002
★★	M1 Motor	EXA1013

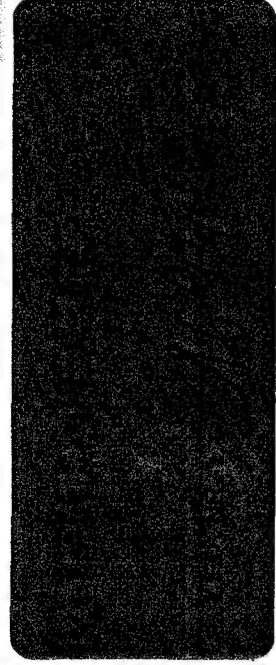
CASSETTE MECHANISM ASSY EXPLODED VIEW
● Part List (Page 71)

KE-3232/UC			KE-4242/UC	KE-4515/US	
Mark	No.	Part No.	Part No.	Part No.	Description
	43.	ENV1016	ENV1016	ENV1024	Tape Guide
★★	60.	EPB1001	EPB1001	EPB1002	Head
	62.	ENP1003	ENP1003	ENP1007	P.C. Board

PACKING METHOD
● Part List (Page 79)

KE-3232/UC			KE-4242/UC	KE-4515/US	
Mark	No.	Part No.	Part No.	Part No.	Description
	1.	CHG1270	CHG1265	CHG1269	Carton
	2.	CXA1773	CXA1773	CXA1637	Knob Assy
★	2-2.	CAA1054	CAA1054	CAA1058	Knob
	4.	CRD1124	CRD1125	CRB1082	Owner's Manual
	12.	CHL1270	CHL1265	CHL1269	Contain Box

Service Manual



The photo shows the model KE-3232/UC.

ORDER NO.
CRT 1090

CASSETTE CAR STEREO WITH FM/AM ELECTRONIC TUNER

KE-3232

UC, ES

KE-3011

US

KE-2222

UC, ES

KE-2515

US

NOTE:

- See the separate manual CRT1094 for the cassette mechanism Assy (EXK1130).

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1094

1. SPECIFICATIONS

General

Power source	14.4V DC (10.8 — 15.6V allowable)
Grounding system	Negative type
Max. Current consumption	
(KE-3232/UC, ES, 3011/US)	2.5A
(KE-2222/UC, ES, 2515/US)	1.8A
Dimensions (chassis)	170(W) x 50(H) x 130(D)mm
(nose)	[6-3/4(W) x 2H x 5-1/8(D)in.]
	[4-1/8(W) x 1-5/8(H) x 1-3/8(D)in.]
Shaft interval	130 or 147mm [5-1/8 or 5-3/4in.]

Weight

(KE-3232/UC, ES, 3011/US)	1.5kg (3.3lbs)
(KE-2222/UC, ES, 2515/US)	1.4kg (3.1lbs)

Amplifier

Continuous power output is 3.2W per channel min. into 4 ohms, both channels driven 50 to 15,000 Hz with no more than 5% THD.

Maximum power output	8.5W x 2/7W x 4 (EIAJ)
(KE-2515/US)	8.5W x 2 (EIAJ)
Continuous power output (KE-3232/ES)	
	4.5W x 2/3.5W x 4 (1%dist. at 1kHz)
Continuous power output (KE-2222/ES)	
	4.5W x 2 (1% dist. at 1kHz)

Load impedance

(KE-3232/UC, ES, 3011/US)	4Ω (4—8Ω allowable)
(KE-2222/UC, ES, 2515/US)	4Ω (2—8Ω allowable)

Maximum output level/output impedance (RCA)

(KE-3232/UC)	500mV/100Ω
Tone controls (bass) (KE-3232/UC, ES)	±10dB (100Hz)
(treble) (KE-3232/UC, ES)	±10dB (10kHz)
Loudness countour	+8dB (100Hz) (Volume: -30dB)
Loudness countour (KE-3232/ES, 2222/ES)	
	+12dB (100Hz), +7dB (10kHz) (Volume: -30dB)

Tape player

Tape	Compact cassette tape (C-30 — C-90)
Tape speed	4.76cm/sec. (+0.14cm/sec., -0.05cm/sec.)
Fast forward/rewind time	Approx. 100sec. for C-60
Wow & flutter	0.13% (WRMS)
Frequency response (KE-3232/UC, ES, 3011/US)	
	Metal: 50 — 17,000 Hz (±3dB)
	Normal: 50 — 14,000Hz (±3dB)

Frequency response (KE-2222/UC, ES, 2515/US)

	50 — 14,000Hz (±3dB)
Stereo separation	45dB

Signal-to-noise ratio

(KE-3232/UC, 2222/UC, 3011/US, 2515/US)	
	52dB (IHF-A network)
(KE-3232/ES, 2222/ES)	52dB (IEC-A network)

FM tuner

Frequency range	(KE-3232/UC, 3011/US, 2222/UC, 2515/US)
	.87.9 — 10.79MHz
(KE-3232/ES, 2222/ES)	.87.5 — 10.8MHz
Usable sensitivity	12dBf (1.1μV/75Ω, mono)
50dB quieting sensitivity	17dBf (1.9μV/75Ω, mono)
Signal-to-noise ratio	
(KE-3232/UC, 2222/UC, 3011/US, 2515/US)	70dB (IHF-A network)
Signal-to-noise ratio (KE-3232/ES, 2222/ES)	
	70dB (IEC-A network)
Distortion	.0.3% (at 65dBf, 1kHz, stereo)
Frequency response	.50 — 15,000 Hz (±3dB)
Stereo separation	35dB (at 65dBf, 1kHz)
AM tuner (KE-3232/UC, 2222/UC, 3011/US, 2515/US)	
Frequency range	530 — 1,620kHz
Usable sensitivity	18μV (25dB) (S/N: 20dB)
Selectivity	50dB (±10kHz)
AM tuner (KE-3232/ES, 2222/ES)	
Frequency range (Initial setting)	531 — 1,602kHz
(New setting)	530 — 1,620kHz
Usable sensitivity	18μV (25dB) (S/N: 20dB)
Selectivity (Initial setting)	50dB (±9kHz)
(New setting)	50dB (±10kHz)

These specifications were determined and are presented in accordance with specification standards established by the Ad Hoc Committee of Car Stereo Manufacturers.

Note:

Specifications and the design are subject to possible modification without notice due to improvements.

2. CONNECTION

Note:

- To avoid shorts in the electrical system, be sure to disconnect the battery ⊖ cable before beginning installation.
- Replace fuses only with the types stipulated on the fuse holder.
- Be sure to properly connect the color coded leads. Failure to do so can cause malfunctions.
- Cover unused terminals with tape to prevent electrical shorts. (KE-3232)
- Refer to the power amp owner's manual when connecting a power amp (sold separately) to the pin jack.
- When using a separately available power amp with RCA terminal in a 4-speaker system with fader control capabilities, connect the brown leads from this unit to the green and gray output leads of this unit. (KE-3232)

Black (ground)	To vehicle (metal) body.
Blue	System control/Auto-antenna relay control terminal (Max. 300 mA 12 V DC).
Orange	To terminal always supplied with power regardless of ignition switch position.
Red	To electric terminal controlled by ignition switch (12 V DC) ON/OFF.

KE-3232 2-speaker system

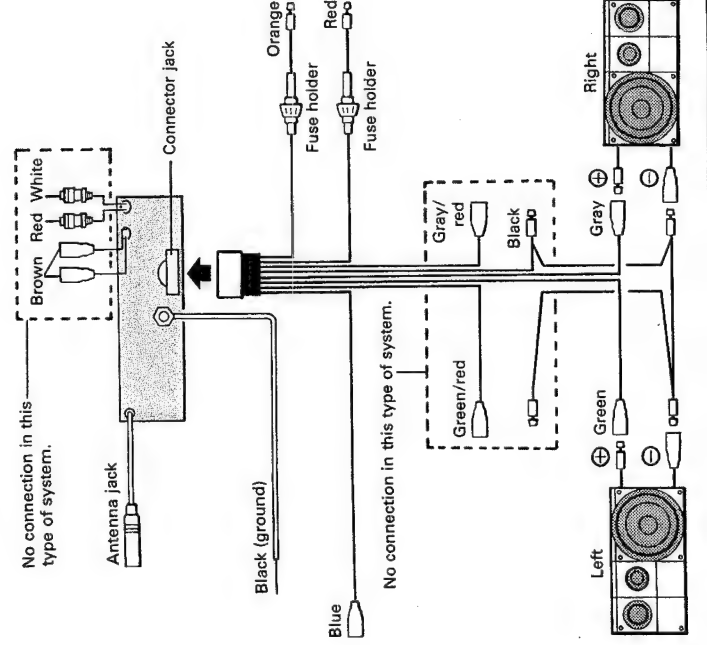


Fig. 1

KE-3232 4-speaker system 1

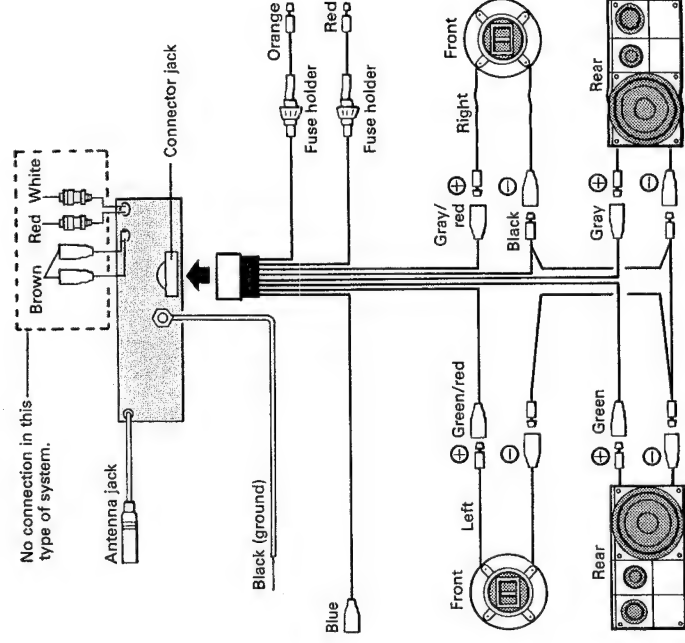
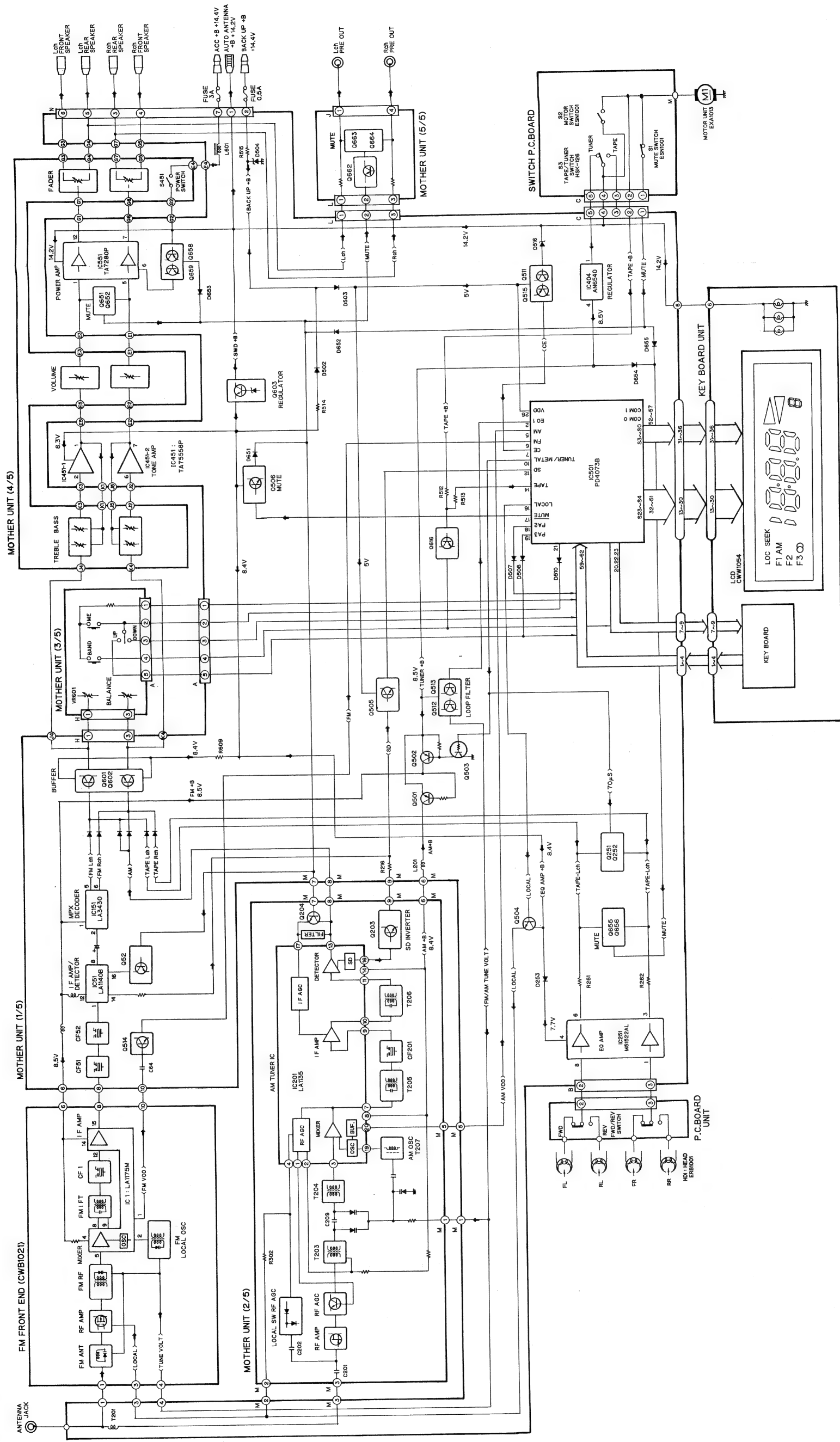


Fig. 2

3. BLOCK DIAGRAM

• KE-3232/UC



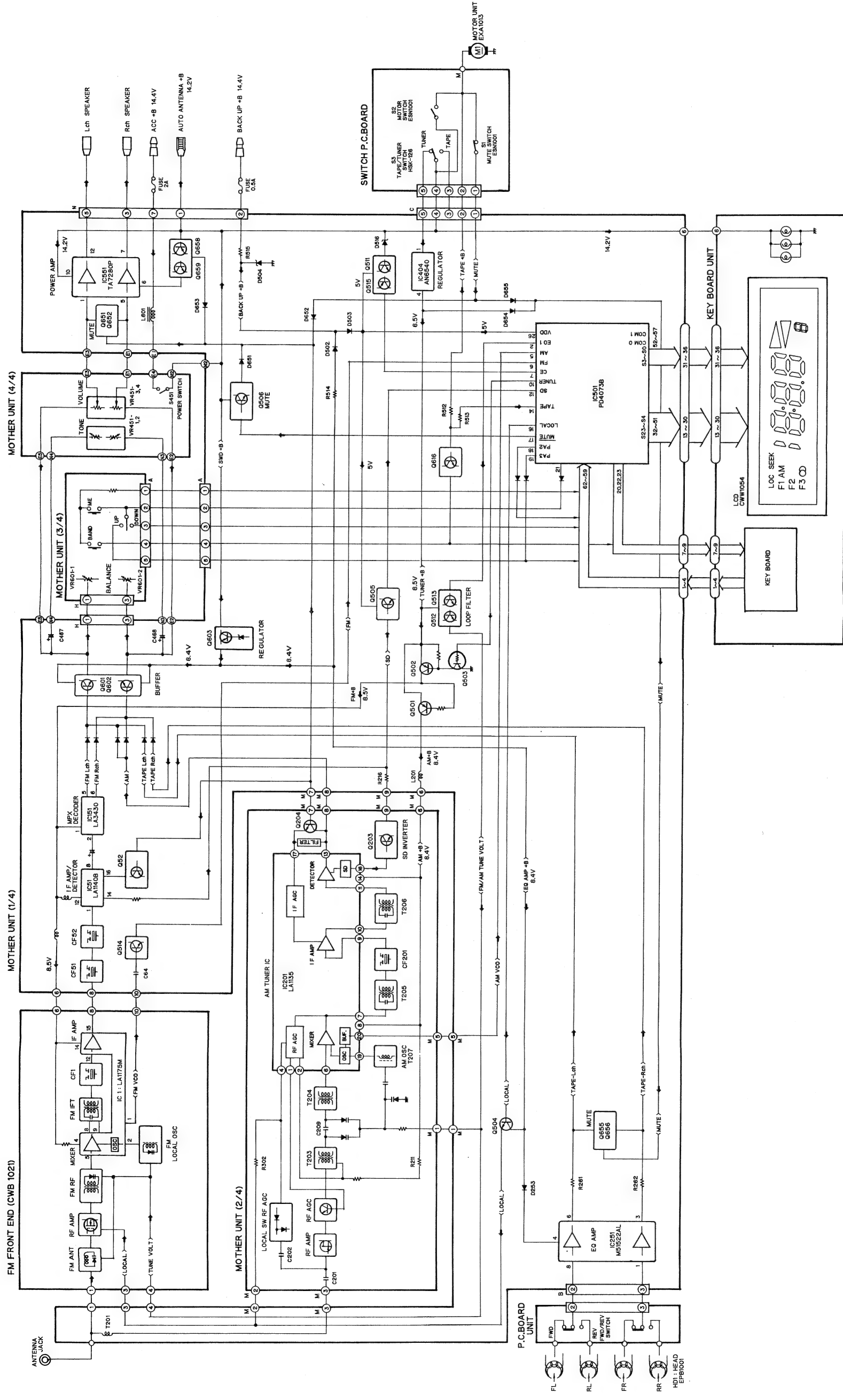


Fig. 6

4. LEVEL DIAGRAM

- KE-3232/UC, ES, 3011/US

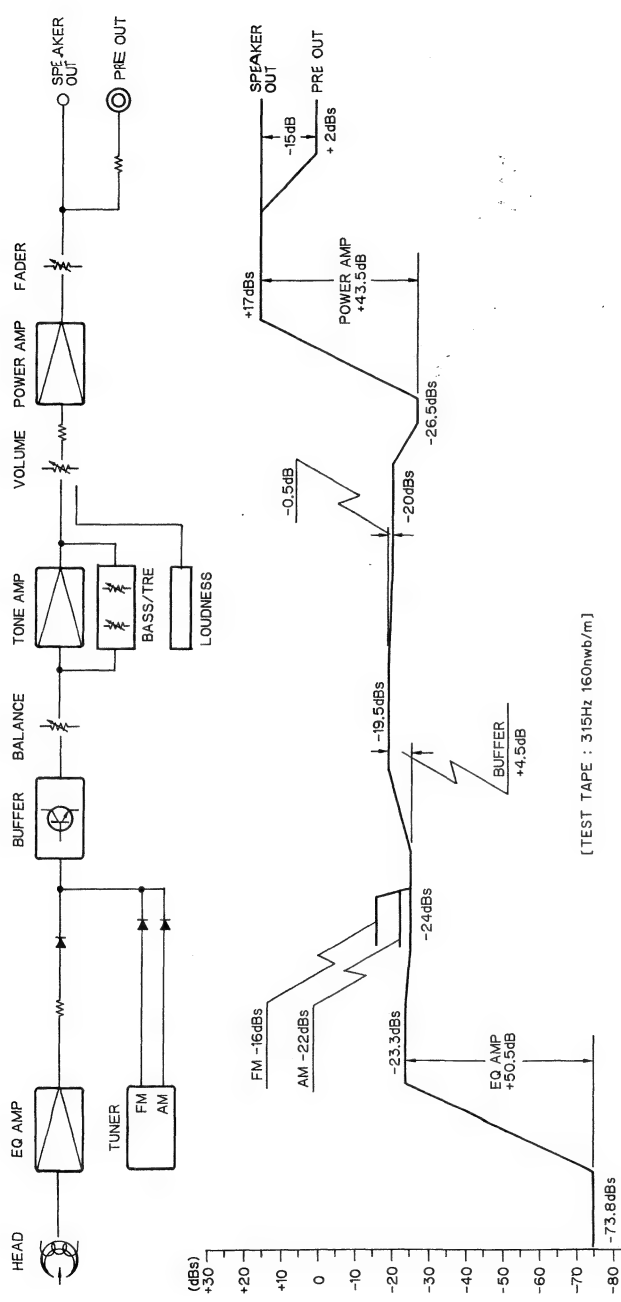


Fig. 7

- KE-2222/UC, ES, 2515/US

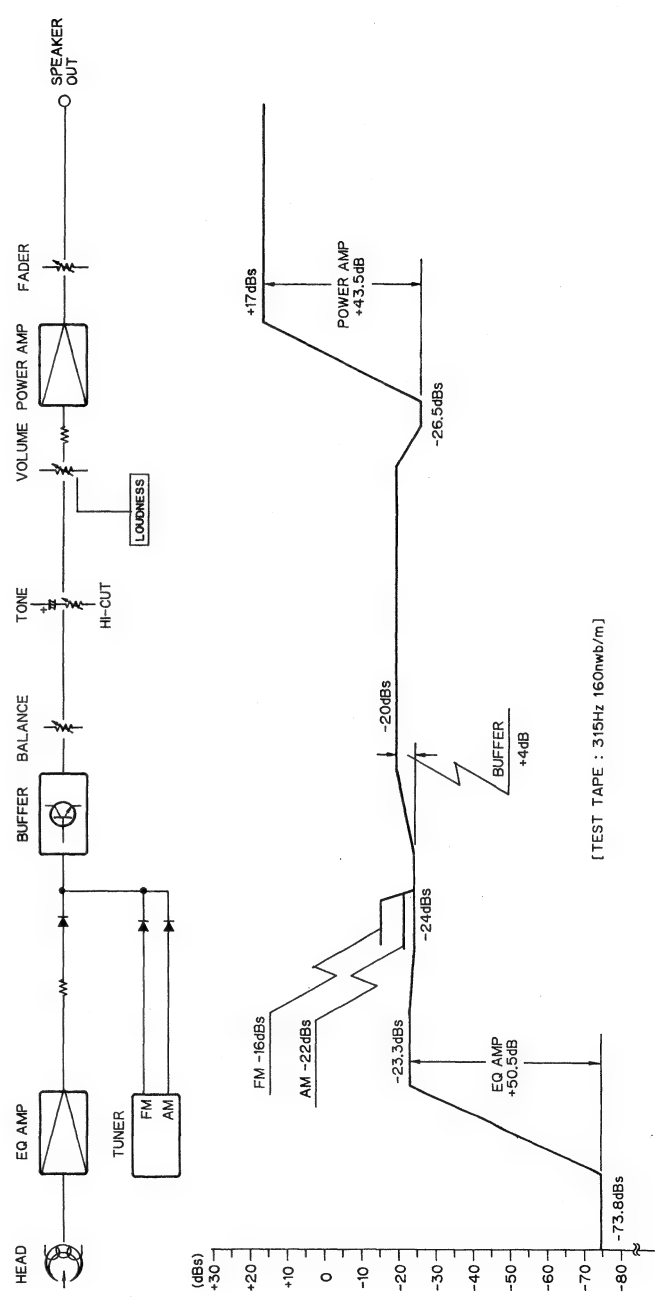


Fig. 8

5. OPERATION

• Using the Radio

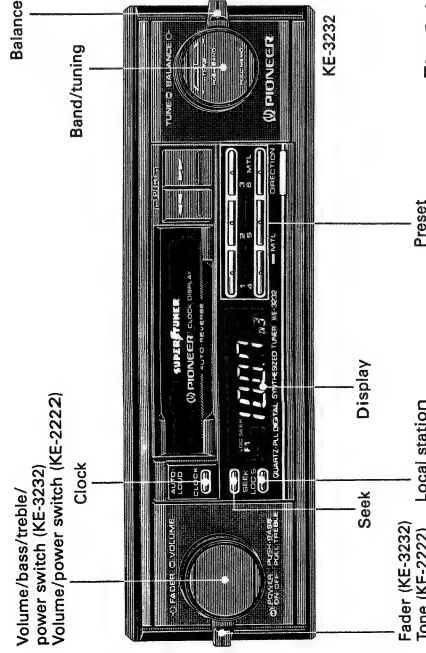


Fig. 9-1

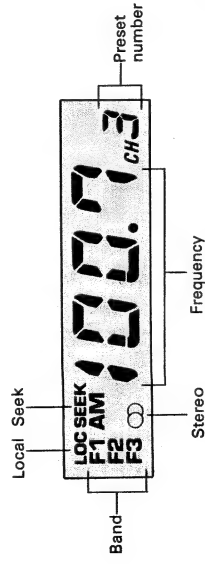


Fig. 9-2

• Local Station Switch

Pressing this switch lowers the seek tuning reception sensitivity so that only stronger signals can be tuned in. This feature is convenient when driving through areas that have numerous radio stations. When this switch is depressed, the local indicator will be illuminated on the display.

• Fader Control (KE-3232)

This control is used to adjust the balance between the front and rear speakers when using a 4-speaker system. Turning the control upwards decreases the volume of the rear speakers, while turning it downwards decreases the volume of the front speakers. With 2-speaker systems, set this control to a horizontal position.

Important

A considerable amount of sound will continue to be produced from speakers of a 4-speaker system which have been cut by setting the fader control either to the front speakers or rear speakers. This tendency is especially noticeable when an separately available amp is connected. This is normal and does not indicate malfunction.

• Auto-Loudness

When playing back a tape or listening to the radio at low volume, the low tone is automatically emphasized.

• Clock Switch

Each press causes the display to switch between clock and frequency.

• Before attempting operation...

- Reduce the volume by turning the volume control knob to the left.
- Set the fader control to the left horizontal. (KE-3232)
- 1. Turning the power switch to the right causes power to switch ON and the current frequency to appear on the display.
- 2. Press the band switch to select the band.
- 3. Press the seek button and the seek tuning indicator will be displayed.
- 4. Turn the tuning knob to the left or right to tune in the desired frequency. (Turning to the right will increase the frequency.)
- 5. Adjust the volume and balance.

KE-3232

- 6. Adjust the tone to the desired position. To adjust low tone, turn the volume knob while pressing it. For high tones, turn the volume knob after it has been pulled out until it clicks into place. Return the volume knob after adjusting the tone.

KE-2222

- 6. Adjust the tone.

• To enter a frequency into the preset memory...

- 7. Pull the tuning knob and preset number will flash. (approximately 5 seconds)
- Within 5 seconds, press one of the preset buttons (1 – 6) to enter the frequency into the memory. At this time the number of the button pressed will be displayed. Six FM1 frequencies, six FM2 frequencies, six FM3 frequencies and six AM frequencies can be entered.

Seek Tuning

Press the seek button, and tuning to the next higher or lower broadcast on the band can be accomplished automatically by simply turning the tuning knob to the left or right. FM frequencies change in 0.2 MHz steps while those in the AM band change in 10 kHz steps.

Preset Tuning

Pressing the preset button instantly tunes in the frequency programmed in the memory for that button.

Preset Scan Tuning (KE-2515/US)

Pressing the preset scan button (CH indicator flashes) causes previously stored frequencies to be tuned in sequentially for eight seconds each. Press again when the desired frequency is tuned in to cancel preset scan tuning.

Manual Tuning

When manual tuning is employed, FM frequencies change in 0.2 MHz steps while AM frequencies change in 10 kHz steps.

1. Press the seek button and the seek tuning indicator will disappear from the display.
2. Change the frequency by turning the tuning knob to the left or right. Turning the knob once will change the frequency one step (see above). Holding the tuning knob in either direction will successively change the frequency at the prescribed step.

● Using the Tape Deck

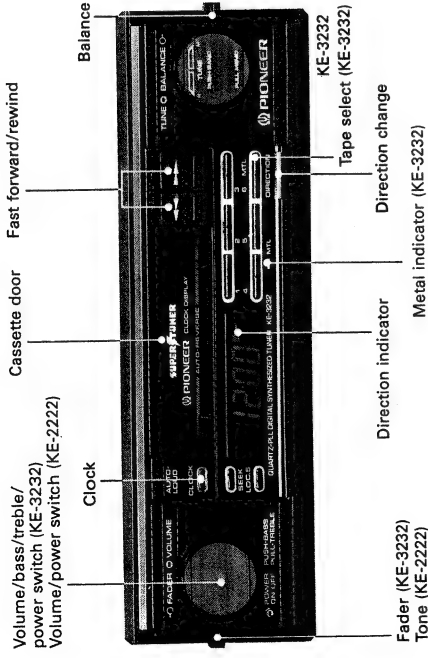


Fig. 10

● Before attempting operation...

- Reduce the volume by turning the volume control knob to the left.
- Set the fader control to the left horizontal. (KE-3232)
- 1. Turning the power switch to the right causes power to switch ON.
- 2. Loading a cassette tape into the load slot causes playback to begin automatically. At this time, the tape transport direction is noted on the display, along with the current time. The unit automatically switches to tape playback even if the radio is ON when the cassette is loaded.
- 3. Adjust the volume and balance.

KE-3232

- 4. Adjust the tone to the desired position. To adjust low tone, turn the volume knob while pressing it. For high tones, turn the volume knob after it has been pulled out until it clicks into place.

● Setting the Time

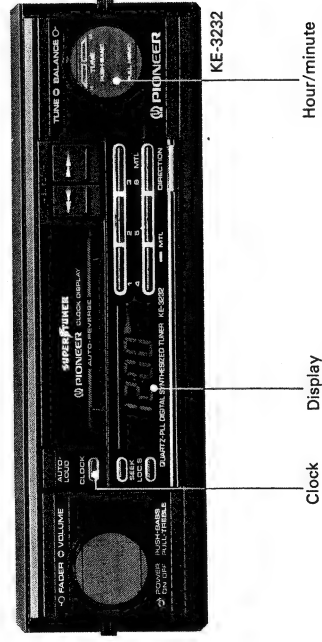


Fig. 11-1

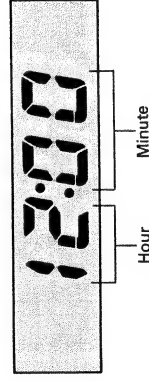


Fig. 11-2

Return the volume knob after adjusting the tone.

KE-2222

4. Adjust the tone.
5. When tape playback reaches the end of the tape, playback will automatically switch from the side being played to the opposite side (ie. Side A to Side B or vice versa) (Auto-reverse). To eject the tape during playback, simultaneously press the fast forward and rewind buttons.
 - Do not try to eject the cassette immediately after insertion, as it will cause malfunction. Wait a few seconds.
 - Be sure to eject the tape when the vehicle's ignition is turned OFF, leaving the tape in the unit can deform the pinch roller causing wow and flutter during tape playback.

● Fast Forward/Rewind

Since the transport can be in either direction, both the left and right high-speed tape transport buttons can be regarded as fast forward/rewind buttons.

For fast forward, press the high-speed tape transport button that corresponds to the direction that is shown by the direction indicator. When the end of the tape is reached, playback will automatically begin from the opposite side of the tape (Auto-reverse).

For rewind, press the button that is opposite that of the direction shown by the direction indicator. When the end of the tape is reached, playback will automatically begin from the beginning of the same side of the tape (Auto-replay).

Fast forward and rewind can be terminated by pressing the respective opposite high-speed tape transport button.

● Direction Change Button

This button is used to switch from one side of the tape to the other (from Side A to Side B or vice versa).

● Tape Select Switch (KE-3232)

This switch is used to switch to the proper mode for the tape being used and should be depressed when using chrome or metal tapes.

1. Press the clock switch to switch to the time display.
2. Pull the hour/minute control knob towards you and turn it to the left to advance hours. Turn to the right to advance minutes. Holding the knob in either position consecutively advances the respective hour/minute display.

- Switching the Tuning Steps (KE-3232/ES, 2222/ES)
- Tuning Step Switch

The tuning step switch is located on the bottom of the unit and is set at shipment from the factory as shown in Fig. 12-1. The setting of this switch should be changed to that shown in Fig. 12-2 for use in North America, Central America, or South America.

Specification		Initial Setting	New Setting
AM	Tuning steps	9 kHz steps	10 kHz steps
	Frequency range	531 — 1,602 kHz	530 — 1,620 kHz

- Be sure to disconnect the  terminal connector from the car battery to prevent short circuits.

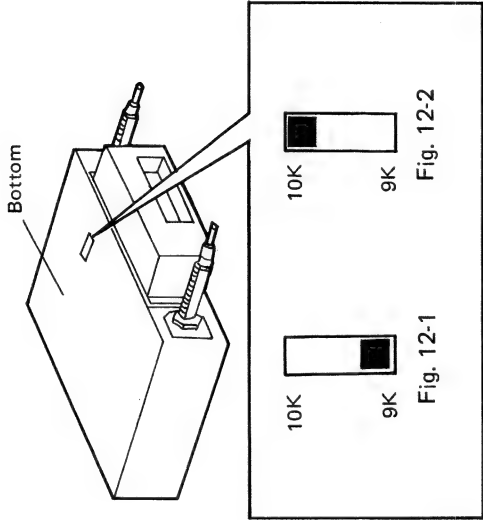


Fig. 13

6. DISASSEMBLY

- Removing the Case

1. Remove the four screws (A), and remove the Case

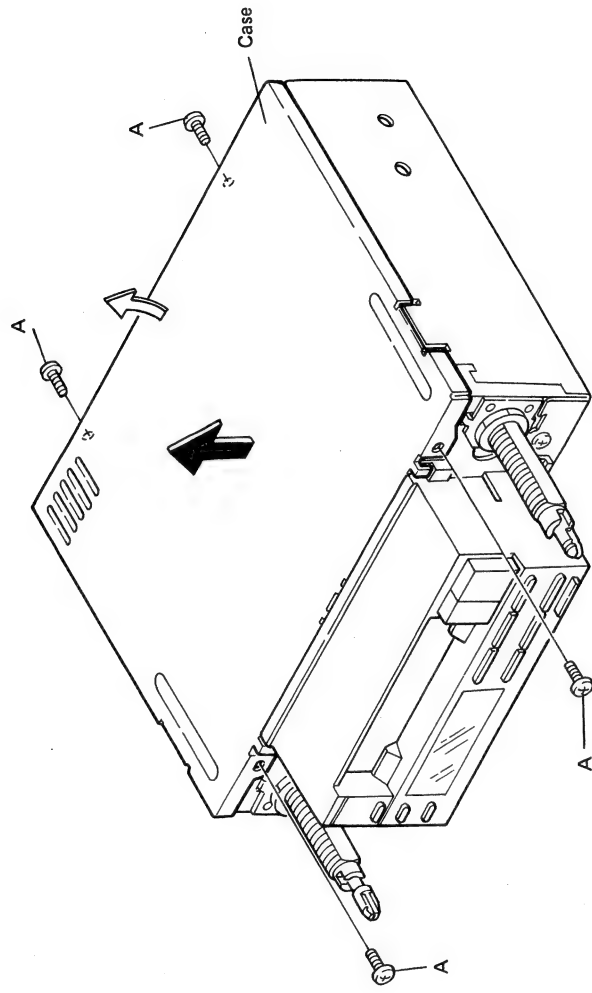


Fig. 14

- Removing the Grille Assy

1. Remove the two hooks.

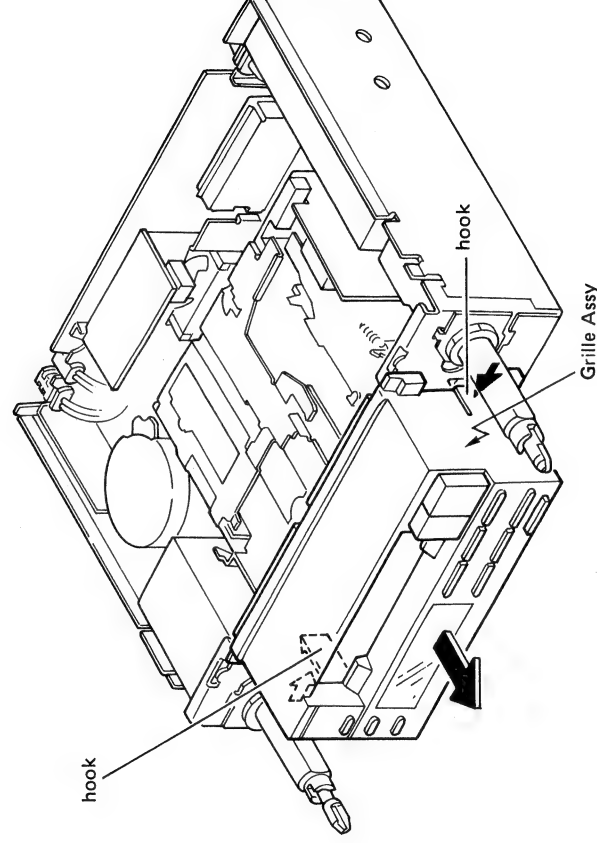


Fig. 15

● Removing the Cassette Mechanism Assy

1. Remove the Connectors (5P x 2).
2. Remove the four screws (B).

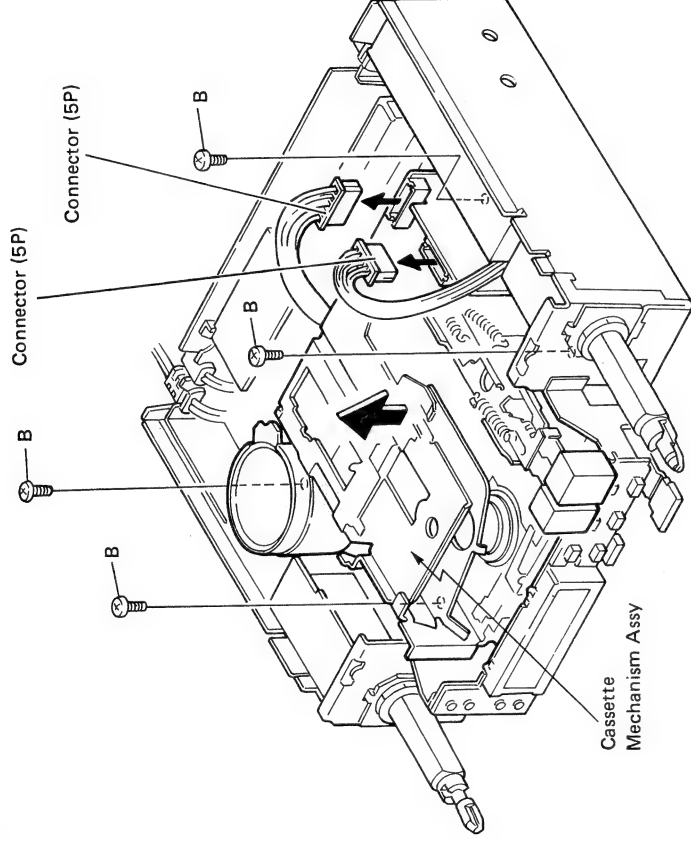


Fig. 16

● Removing the chassis Unit

1. Remove the five screws (C).
2. Stretch the claw.

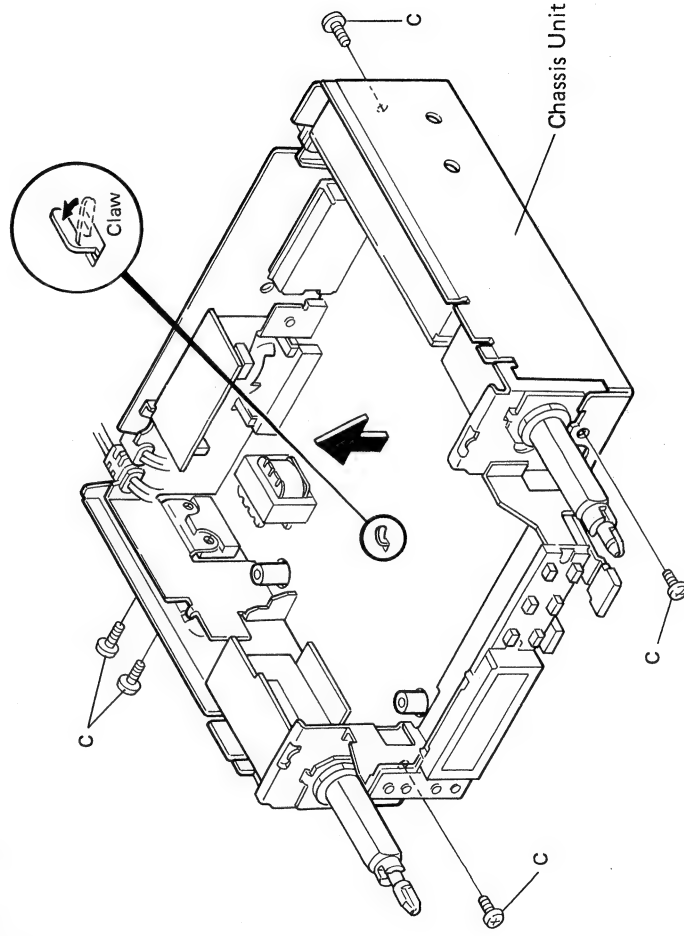


Fig. 17

7. ADJUSTMENT

7.1 HEAD AZIMUTH ADJUSTMENT

- Connection Diagram

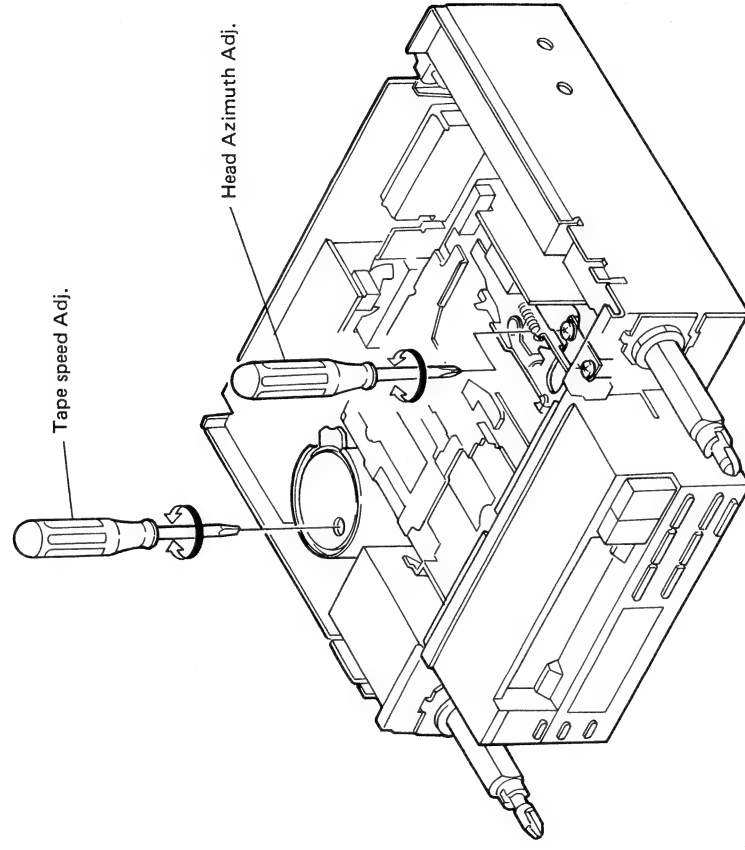


Fig. 18

- To Adjust

1. Play "A" side of STD-341A (10kHz, -20dB). Adjust each screw for maximum output in forward and reverse directions.
2. Play "B" side in forward and reverse directions to confirm adjustment.

7.2 TAPE SPEED ADJUSTMENT

- Connection Diagram (shown in Fig. 18)

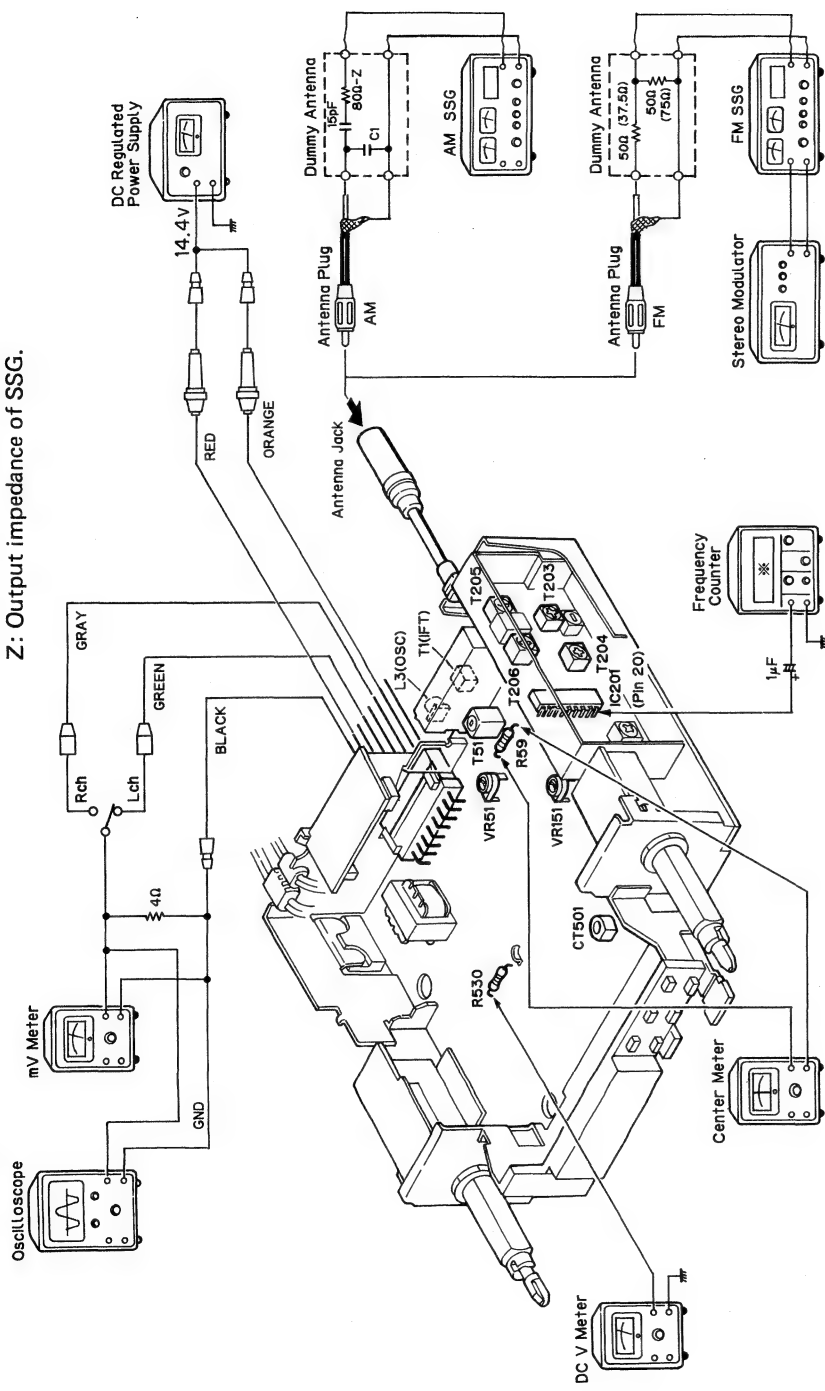
- To adjust

1. Reproduce STD-301 (3kHz, -10dB). Adjust the semi-fixed resistor so that the frequency counter shows 3,010Hz (+30Hz, -30Hz).

7.3 FM IF ADJUSTMENT

● Connection Diagram

NOTICE:
Select C1 so that total capacity of 80pF is attained from the direction of the receiver jack.
Z: Output impedance of SSG.



* 2070kHz: KE-3232/UC, 3011/US, 2222/UC, 2515/US
2052kHz: KE-3232/ES, 2222/ES

Fig. 19

● To Adjust

1. Apply a signal of 98.1MHz, 400Hz, 100% modulation and 60dB (μ V) from the FM SSG and tuner 98.1MHz.
2. Adjust T51 to make the center meter show 0.

7.4 AUTO LEVEL ADJUSTMENT

● Connection Diagram (Shwon in Fig. 19)

● To Adjust

1. Set SSG at 98.1MHz and tune using the tuning button.
2. Set SSG to an output level of 35 dB (μ V), and adjust VR151 to a separation of 5 dB (between the right and left channels).

7.5 FM SCAN SENSITIVITY

● Connection Diagram (Shown in Fig. 19)

● To Adjust

1. Turn off the Local Station Seek switch.
2. Add a 98.1MHz (400Hz, 100% modulation) output level 25dB (μ V) signal from the SSG.
3. Push the SEEK button, and adjust VR51 so that the SEEK stops.
4. Set the SSG output level to 14dB (μ V). And check to make sure that the SEEK doesn't stop.
5. Push the Local Station Seek switch and set it to Loc.S.
6. Check to make sure that the SEEK stops when the SSG output level is 47 ± 10 dB (μ V).
7. If it is not within specifications, repeat the procedure starting at step one.

7.6 AM (MW) TRACKING ADJUSTMENT

- Connection Diagram (shown in Fig. 19)

- To Adjust (KE-3232/ES, 2222/ES)

Frequency of AM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	1,602 kHz	For Conformation only	Less than 7.4V	
2.	531 kHz	For Conformation only	More than 0.7V	
3. 603 kHz (400 Hz, 30% modulation) output level 25 dB (μV)	603 kHz	T203, T204 T205, T206		Maximum output
603 kHz 4. 999 kHz (400 Hz, 30% modulation) 1,395 kHz output level 35 dB (μV)	603 kHz 999 kHz 1,395 kHz	For Conformation Only		The difference between the maximum and minimum output levels at 603 kHz, 999 kHz, and 1,395 kHz must be 6 dB or less.

- To Adjust (KE-3232/UC, 3011/US, 2222/UC, 2515/US)

Frequency of AM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	1,620 kHz	For Conformation only	Less than 7.4V	
2.	530 kHz	For Conformation only	More than 0.7V	
3. 600 kHz (400 Hz, 30% modulation) output level 25 dB (μV)	600 kHz	T203, T204 T205, T206		Maximum output
600 kHz 4. 1,000 kHz (400 Hz, 30% modulation) 1,400 kHz output level 35 dB (μV)	600 kHz 1,000 kHz 1,400 kHz	For Conformation Only		The difference between the maximum and minimum output levels at 600 kHz, 1,000 kHz, and 1,400 kHz must be 6 dB or less.

7.7 FM TRACKING ADJUSTMENT

- Connection Diagram (shown in Fig. 19)

- To Adjust (KE-3232/ES, 2222/ES)

Frequency of FM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	108 MHz	L3	Less than 7.4V	
2.	87.5 MHz		More than 1.6V	
3. 98.1 MHz (400Hz, 100% modulation) output level 5 ~ 10 dB (μV)	98.1MHz	T1		Maximum output

- To Adjust (KE-3232/UC, 3011/US, 2222/UC, 2515/US)

Frequency of FM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	107.9 MHz	L3	Less than 7.4V	
2.	87.9 MHz		More than 1.6V	
3. 98.1 MHz (400 Hz, 100% modulation) output level 5 ~ 10 dB (μV)	98.1 MHz	T1		Maximum output

7.8 REFERENCE OSCILLATION FREQUENCY ADJUSTMENT

- Connection Diagram (shown in Fig. 19)

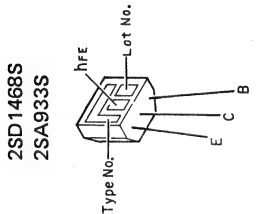
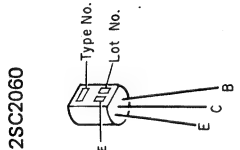
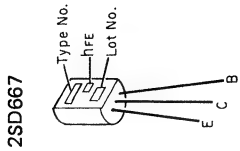
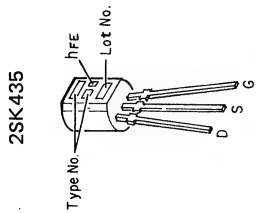
- To Adjust (KE-3232/UC, 3011/US, 2222/UC, 2515/US)

1. Set the AM position.
2. Set the LCD display to 1620KHz.
3. Adjust CT501 so that the frequency counter display becomes 2070kHz ±40Hz.

- To Adjust (KE-3232/ES, 2222/ES)

1. Set the AM position.
2. Set the LCD display to 1602KHz.
3. Adjust CT501 so that the frequency counter display becomes 2052kHz ±40Hz.

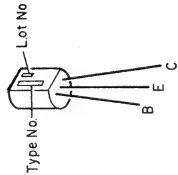
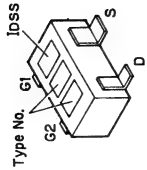
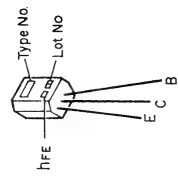
• ICs and Transistors



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2SC2458
2SA1048
2SC3113

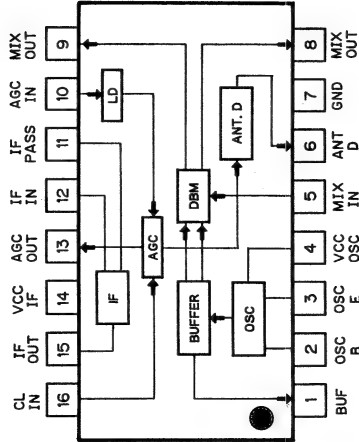
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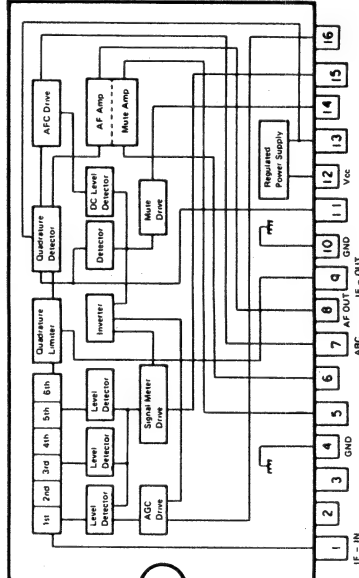


• FM FRONT END

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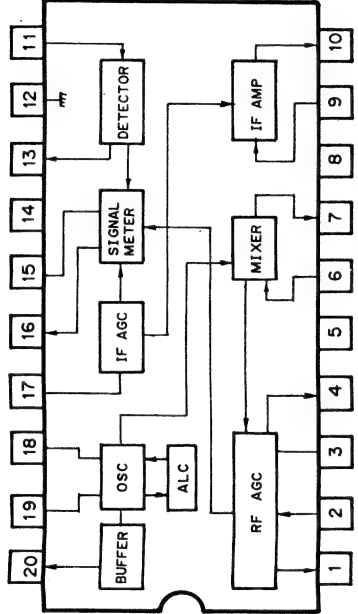


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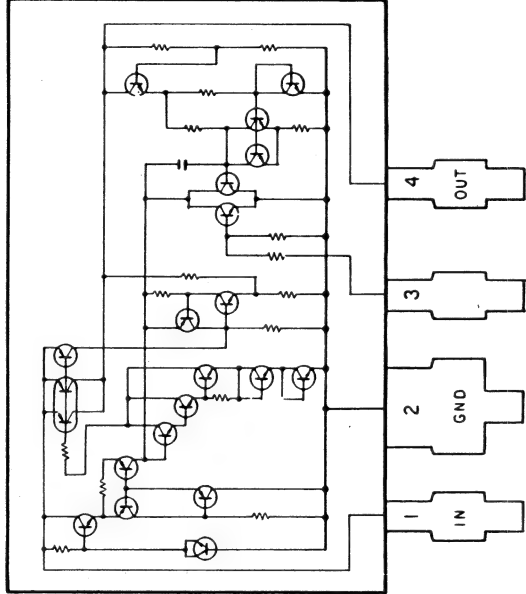


• MOTHER UNIT

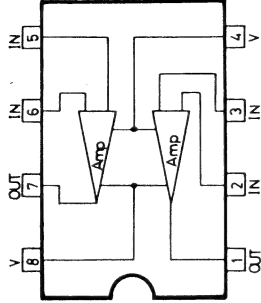
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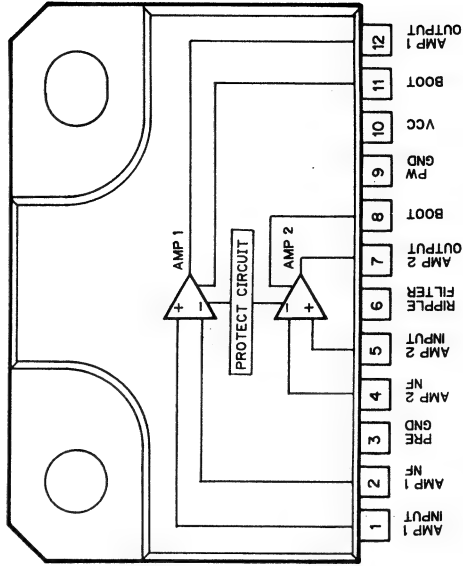
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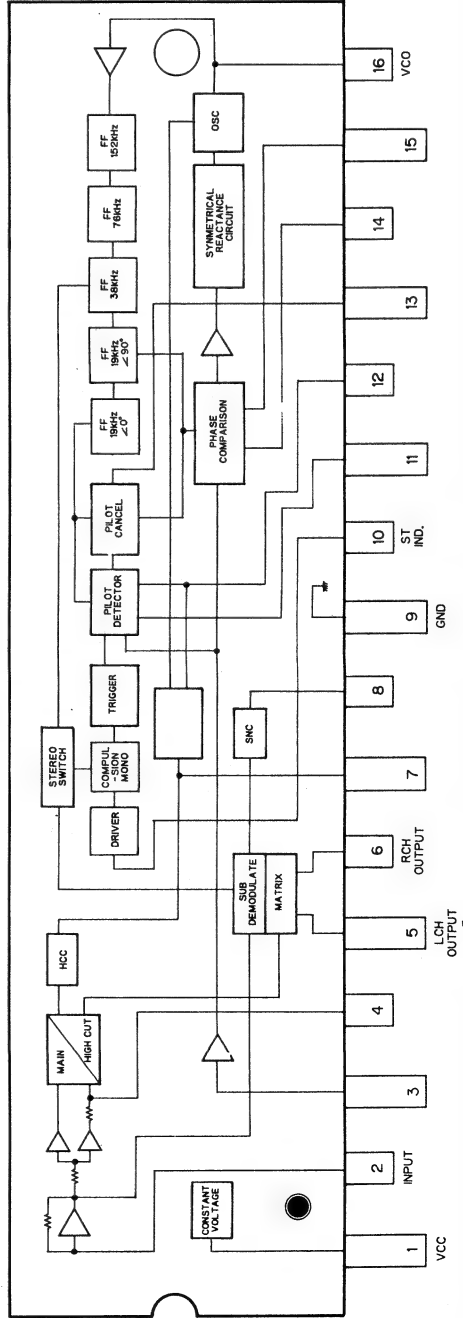
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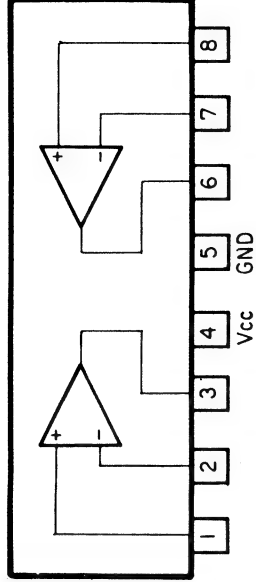
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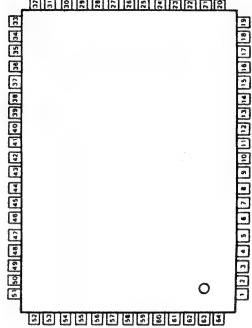
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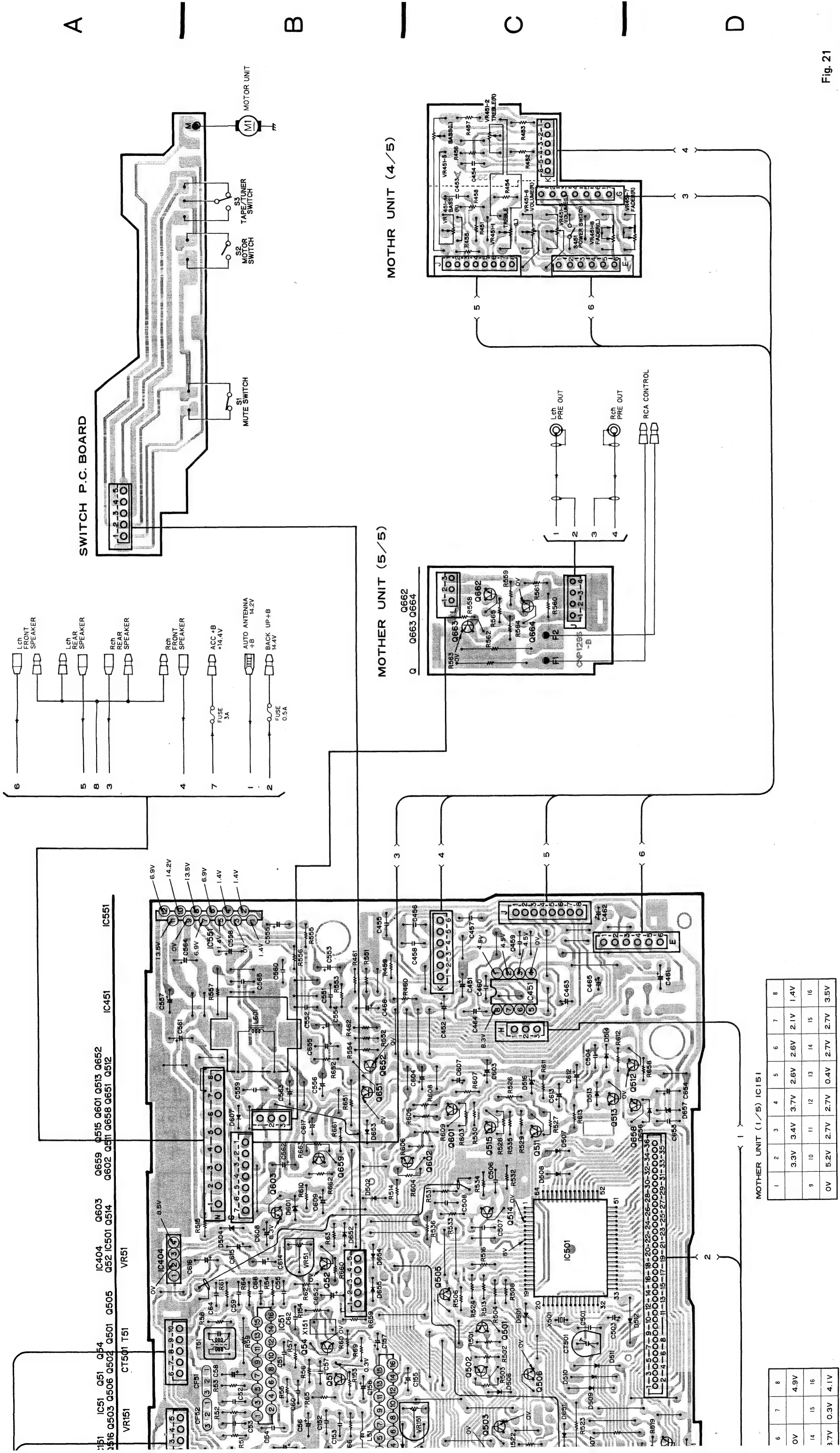
IC251: M51522AL



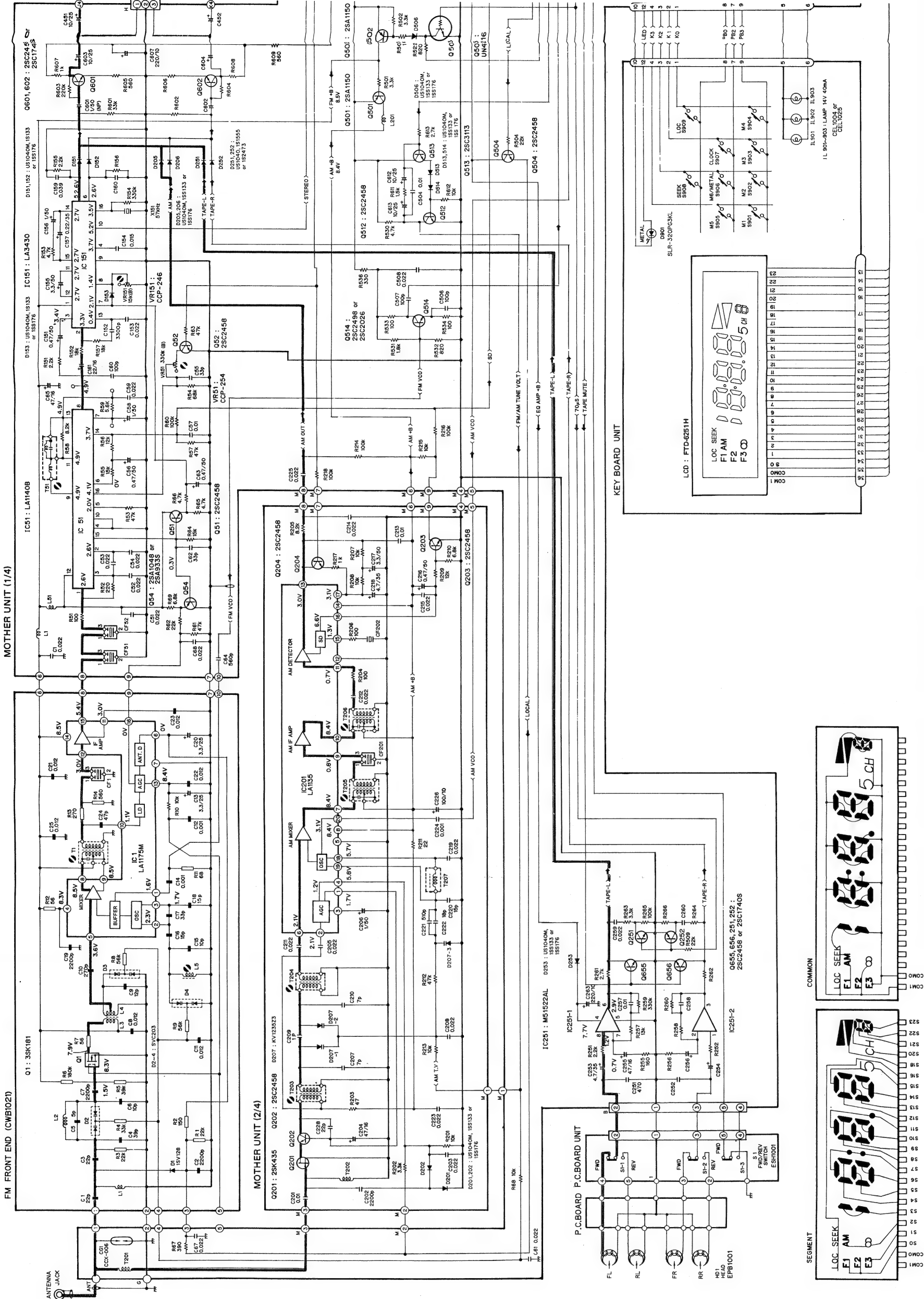
*IC501: PD4073B



IC's marked by * are MOS type.
Be careful in handling them because they are very liable to be damaged by electrostatic induction.



10. SCHEMATIC CIRCUIT DIAGRAM (KE-3011/US)



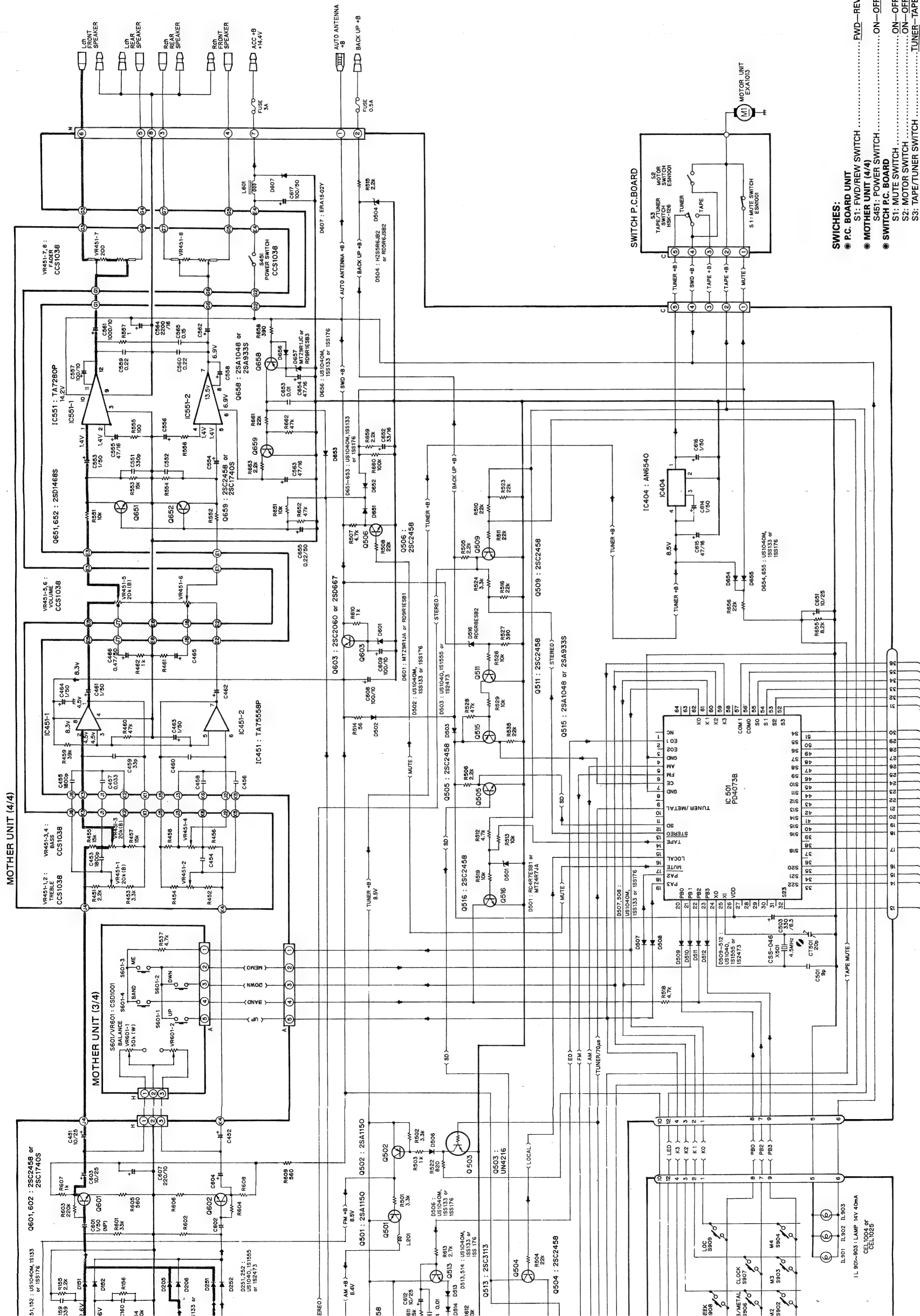


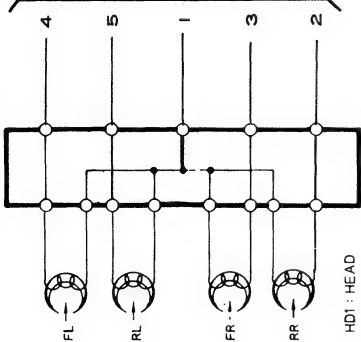
Fig. 22

11. CONNECTION DIAGRAM (KE-3011/US)

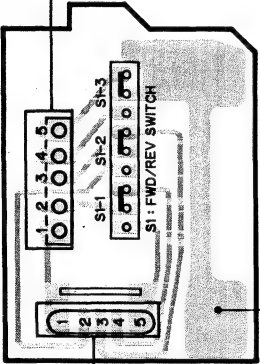
FM FRONT END IC1

1	2	3	4	5	6	7	8	9
1.6V	2.3V	1.7V	8.3V	3.6V	0V	0V	8.5V	8.5V
10	11	12	13	14	15	16	17	18
1.1V	3.0V	3.0V	8.4V	8.5V	5.4V	0V		

P.C. BOARD

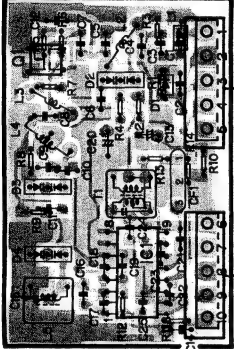


P.C. BOARD UNIT



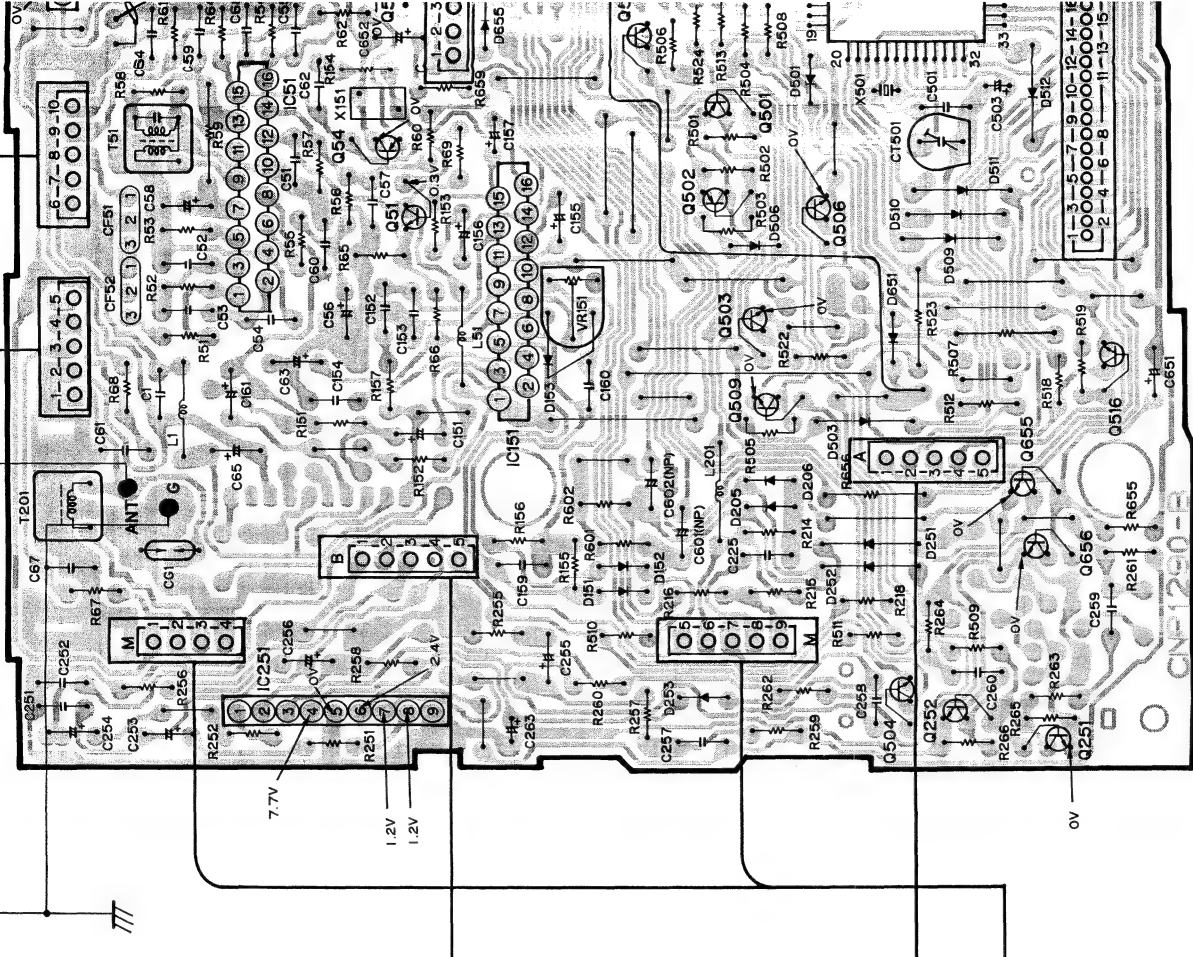
FM FRONT END (CWB1021)

IC. Q IC1
ADJ L5 T1

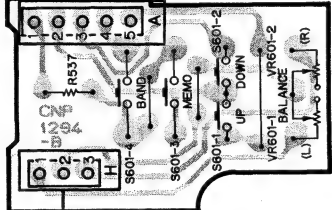


MOTHER UNIT (1/4)

IC251 Q504
IC. Q Q251 Q252
ADJ
IC151 IC51 Q51 Q54
Q509 Q516 Q503 Q506 Q502 Q501 Q505
VR151 CT501 T51

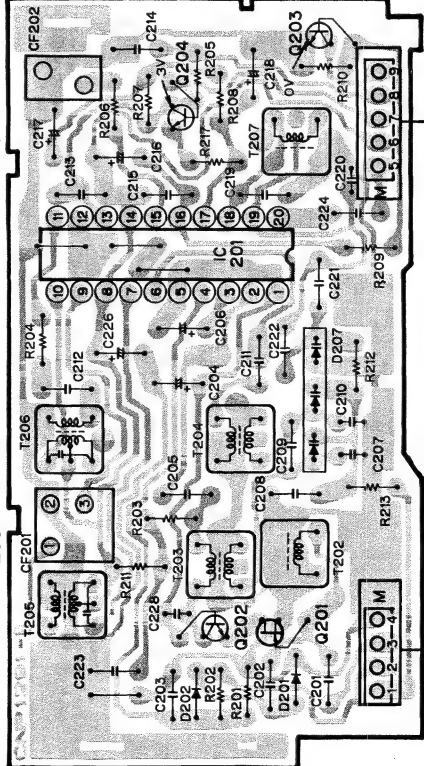


MOTHER UNIT (3/4)



MOTHER UNIT (2/4)

IC. Q Q202 Q201
ADJ T205 T203 T204 T206 Q204 Q203



KEY BOARD UNIT

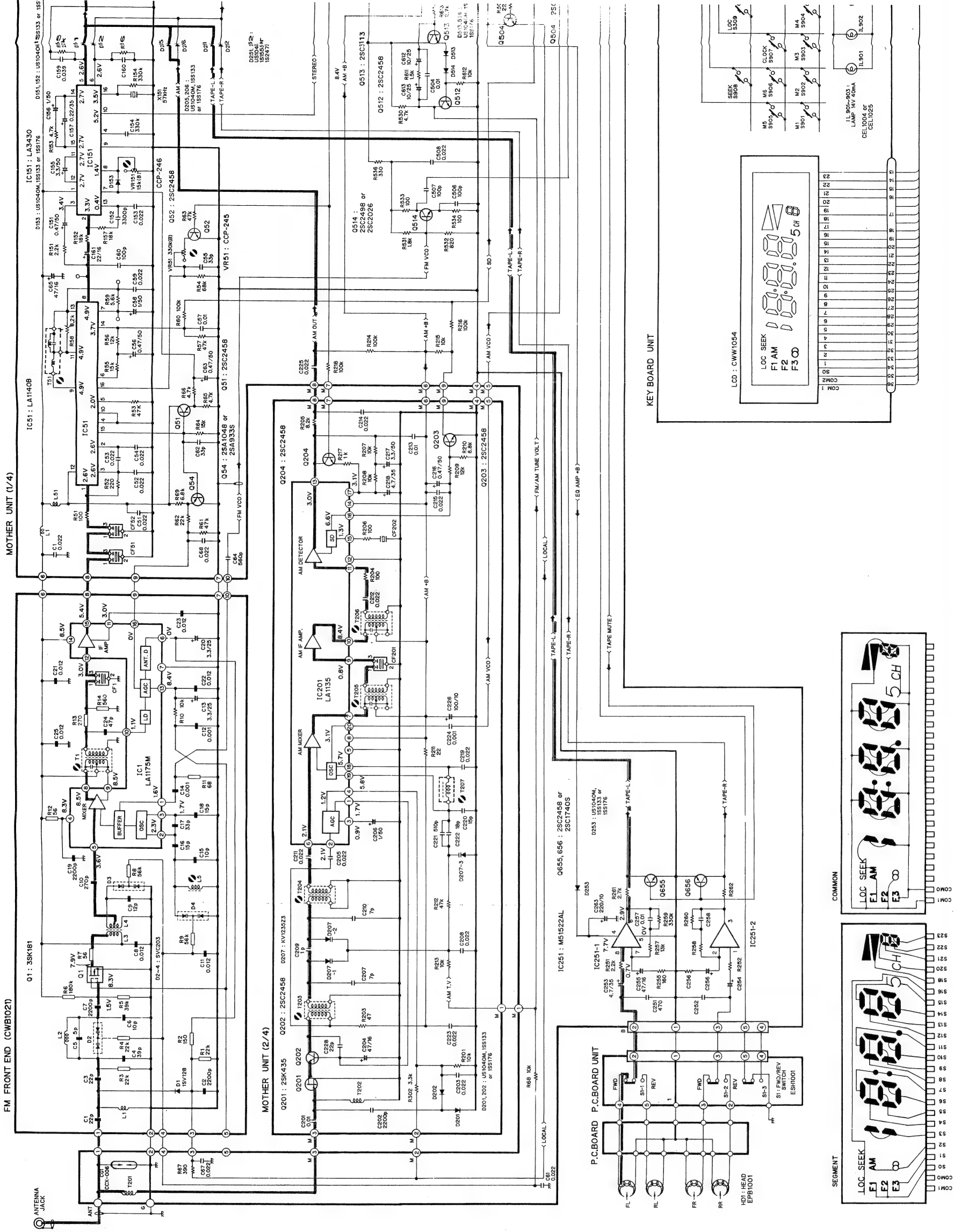
MOTHER UNIT (2/4) IC201

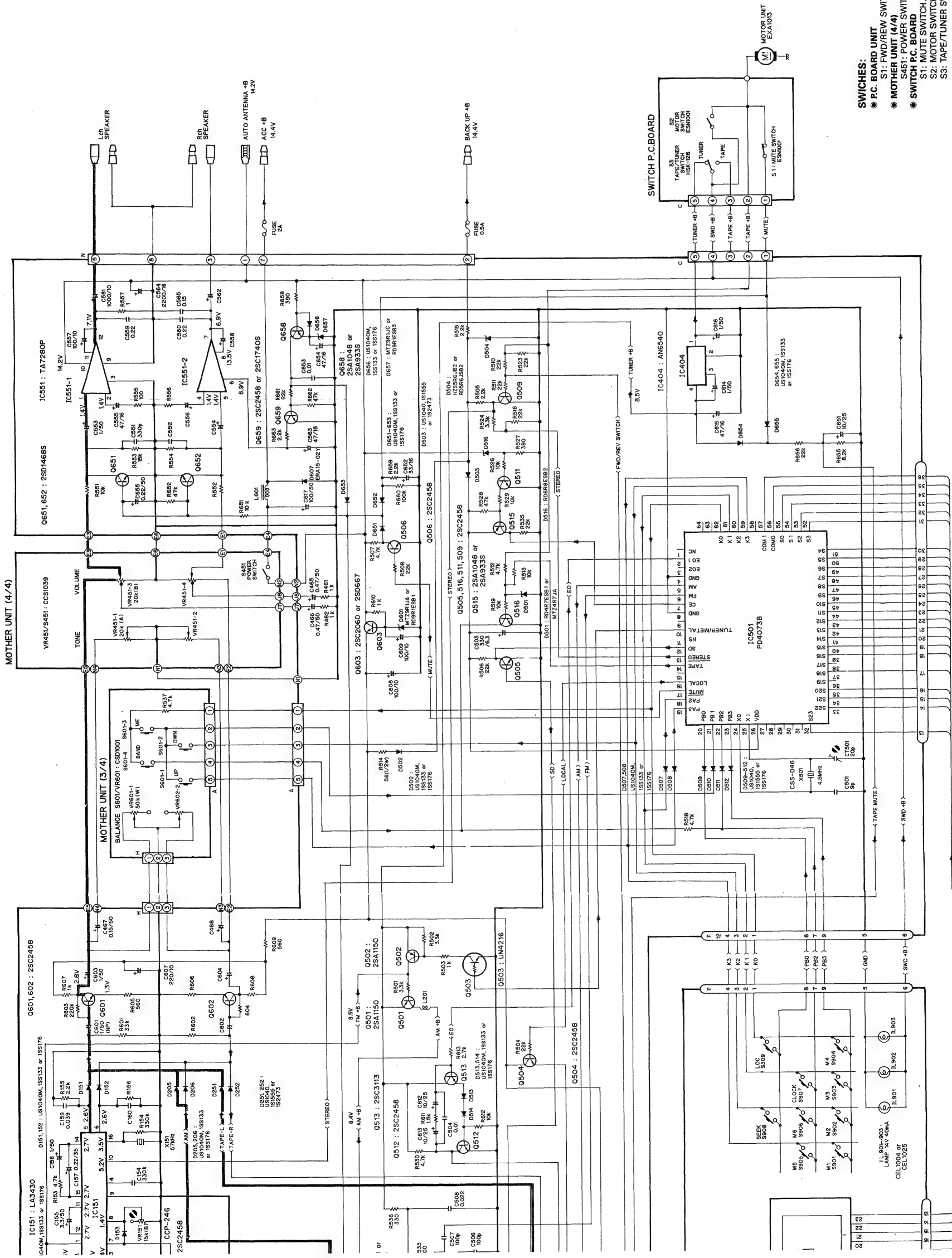
1	2	3	4	5	6	7	8	9	10
1.7V	2.1V		1.2V	0V	2.1V	8.4V	8.4V	0.8V	8.4V
11	12	13	14	15	16	17	18	19	20
0.7V	0V	3.0V		1.3V	6.6V	3.1V	5.7V	5.8V	3.1V

MOTHER UNIT (1/4) IC51

1	2	3	4	5	6	7	8
2.6V	2.6V		0V	2.0V	0V		4.9V
9	10	11	12	13	14	15	16
4.9V	0V	4.9V		4.9V	3.7V	0.3V	4.1V

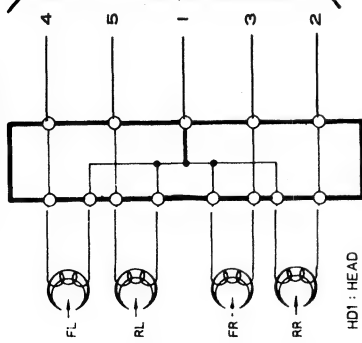
12. SCHEMATIC CIRCUIT DIAGRAM (KE-2222/UC)



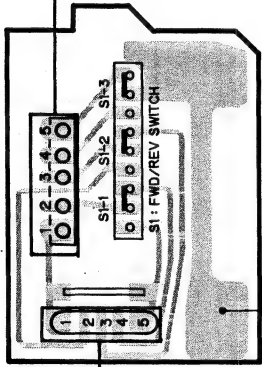


13. CONNECTION DIAGRAM (KE-2222/UC)

P.C. BOARD

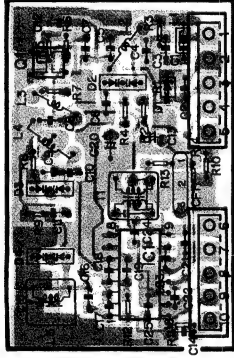


P.C. BOARD UNIT



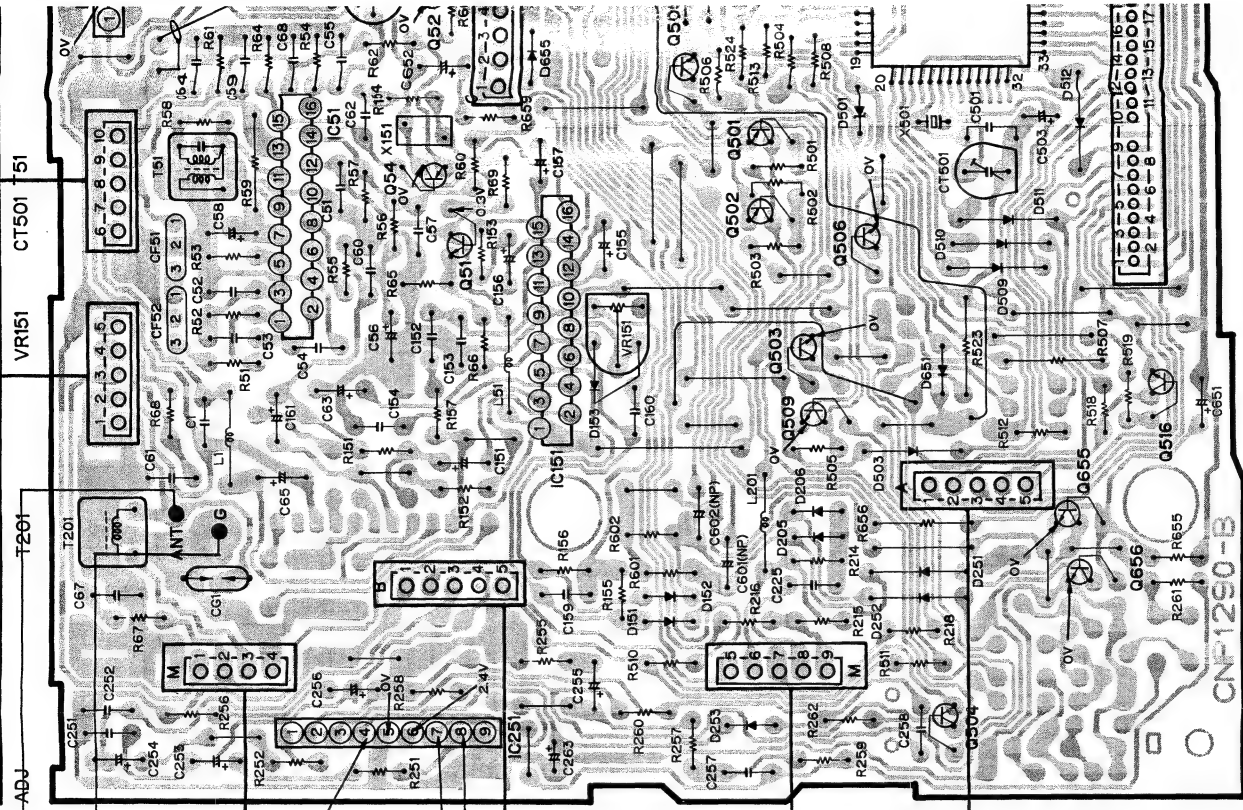
FM FRONT END (CWBI021)

IC, Q IC1
ADJ L5 T1 Q1



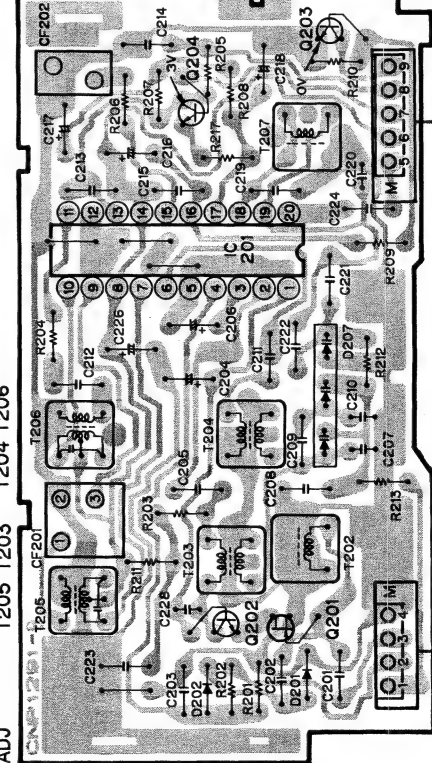
MOTHER UNIT (1/4)

IC, Q IC251 Q504 Q656 Q655 Q509 Q516 Q503 IC151 Q506 Q501 IC505 Q54

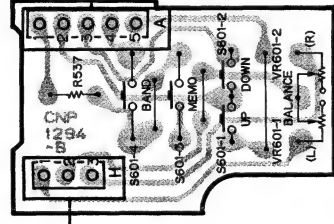


MOTHER UNIT (2/4)

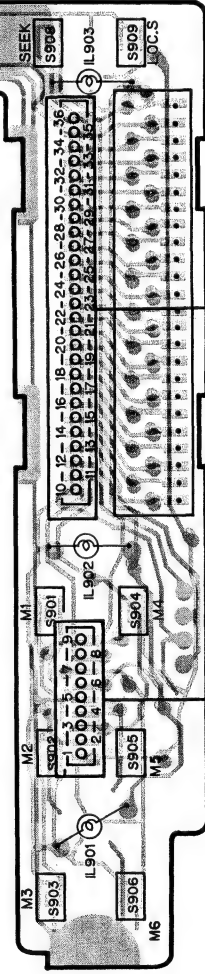
IC, Q Q202 Q201
ADJ T205 T203 T204 T206



MOTHER UNIT (3/4)



KEY BOARD UNIT



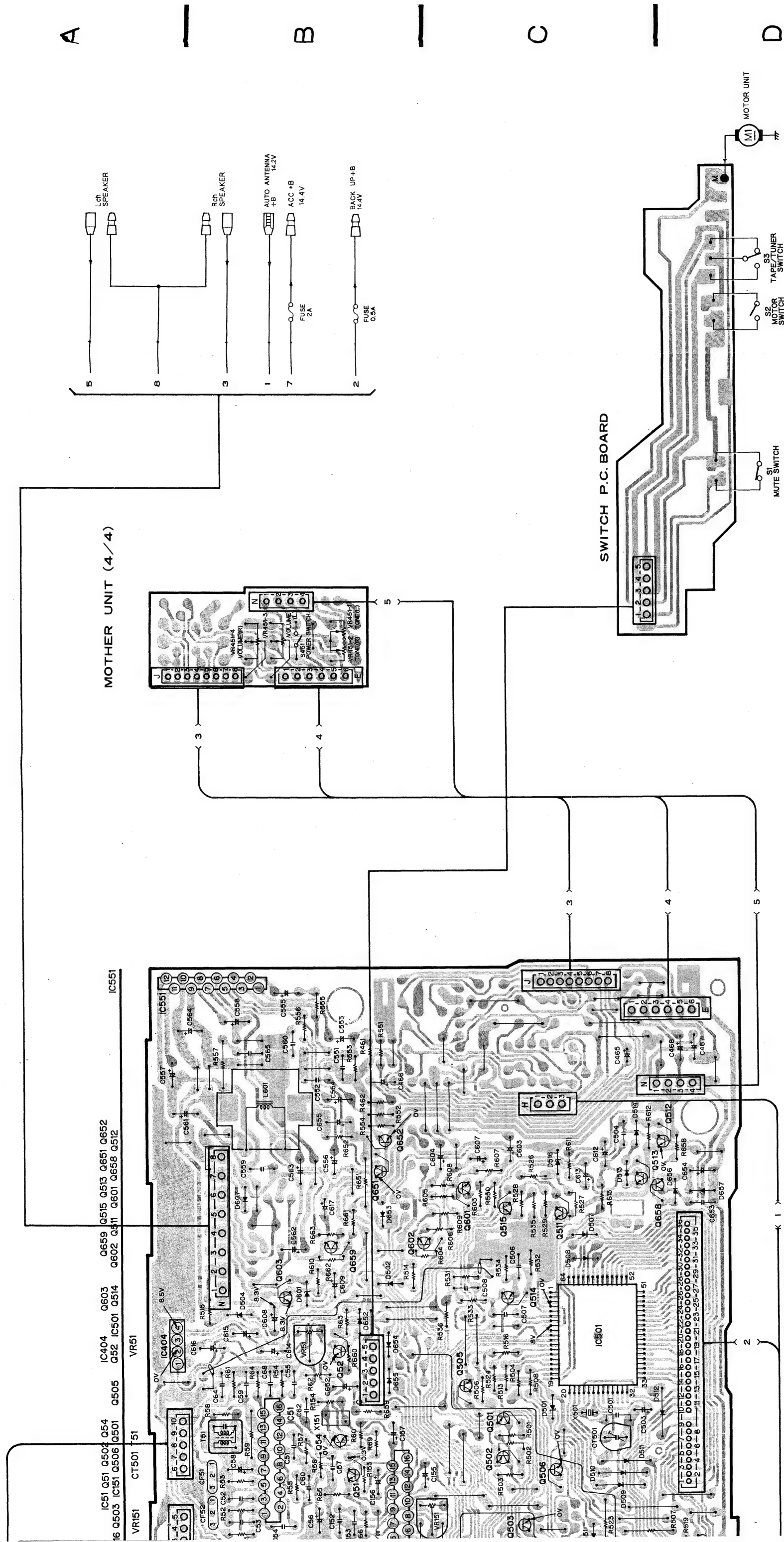
MOTHER UNIT (2/4) IC201

1	2	3	4	5	6	7	8	9	10
1.7V	2.1V	0V	2.1V	8.4V	8.4V	0.8V	8.4V	0.8V	8.4V
0.7V	0V	3.0V	1.3V	6.6V	3.1V	5.7V	5.8V	3.1V	0.7V

MOTHER UNIT (1/4) IC51

1	2	3	4	5	6	7	8
2.6V	2.6V	0V	2.0V	0V	4.9V	4.9V	4.9V
4.9V	0V	4.9V	4.9V	3.7V	0.3V	4.1V	4.1V

1	2	3	4	5	6	7	8	9
1.6V	2.3V	1.7V	8.3V	3.6V	0V	8.5V	8.5V	8.5V
1.1V	3.0V	3.0V	8.4V	8.5V	5.4V	0V	0V	0V



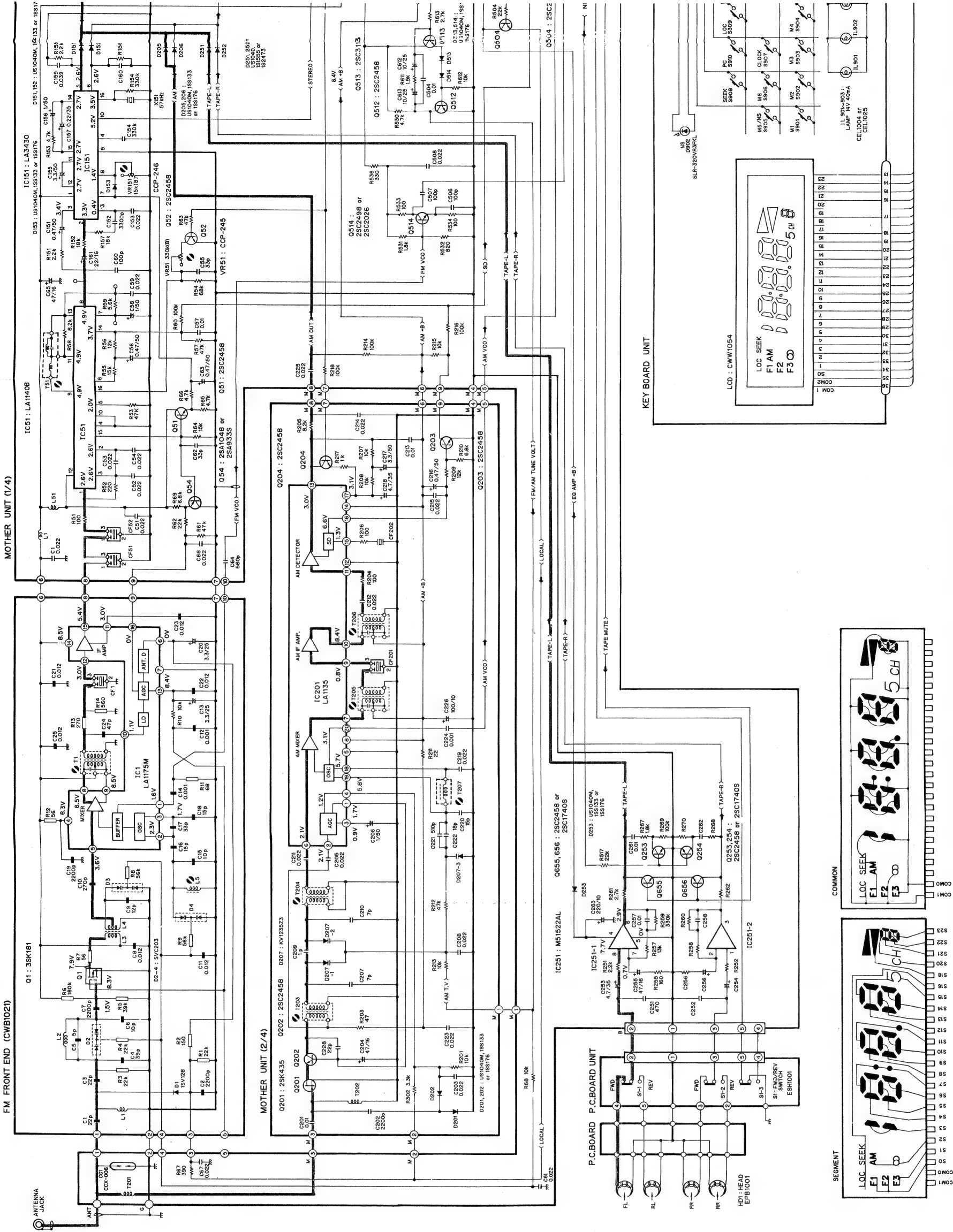
MOTHER UNIT (1/4) IC151

1	2	3	4	5	6	7	8
		3.3V	3.4V	3.7V	2.6V	2.1V	1.4V
9	10	11	12	13	14	15	16
0V	5.2V	2.7V	2.7V	0.4V	2.7V	2.7V	3.5V

7	8
	4.9V
15	16
0.3V	4.1V

Fig. 25

14. SCHEMATIC CIRCUIT DIAGRAM (KE-2515/US)



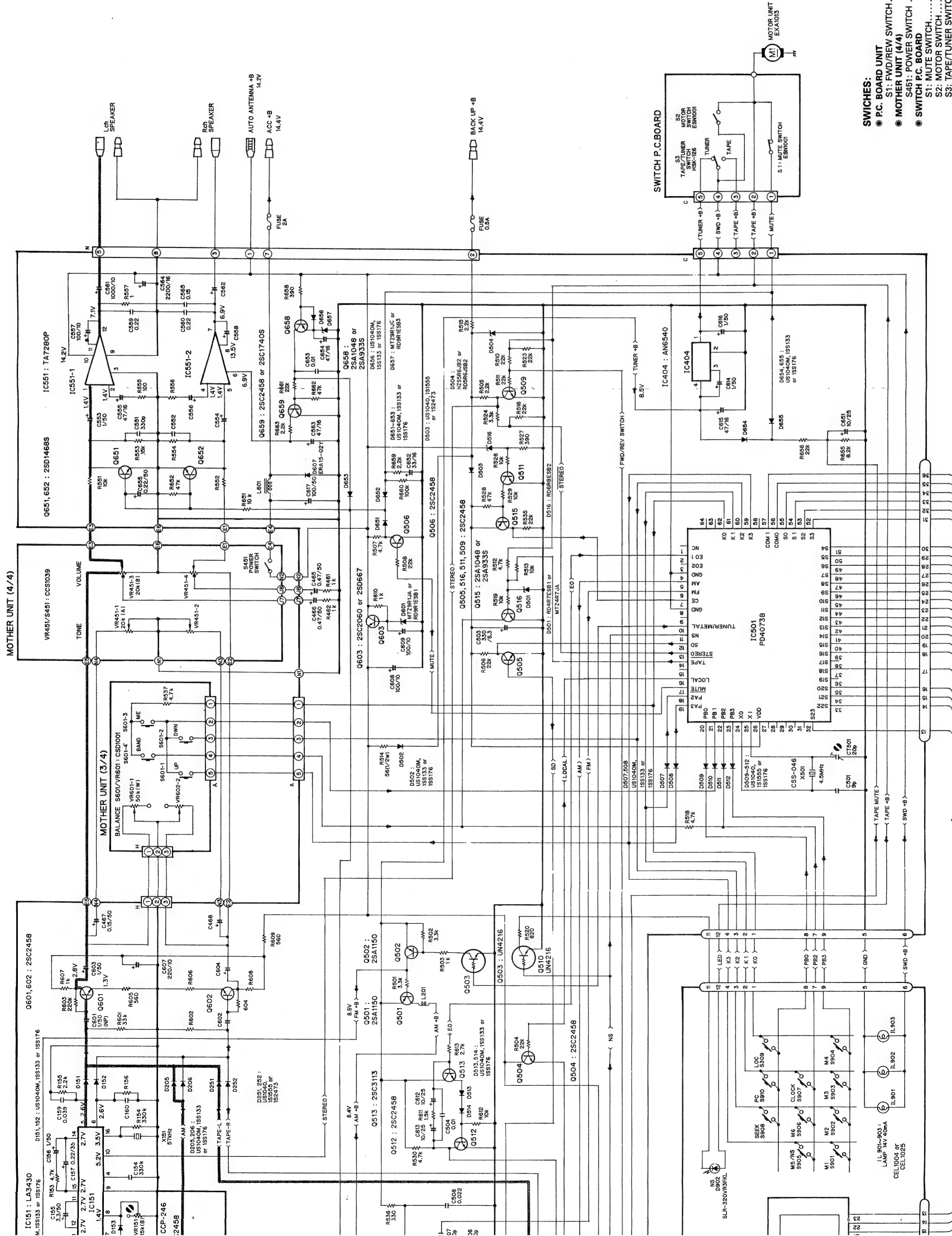
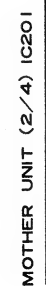
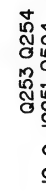
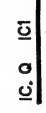
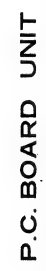
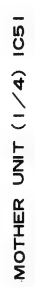


Fig. 26

60



1	2	3	4	5	6	7	8	9	10
1.7V	2.1V		1.2V	OV	2.1V	8.4V	8.4V	0.8V	8.4V
11	12	13	14	15	16	17	18	19	20
0.7V	OV	3.0V		1.3V	6.6V	3.1V	5.7V	5.8V	3.1V



	1	2	3	4	5	6	7	8
	26V	26V		0V	2.0V	0V		4.9V
	9	10	11	12	13	14	15	16
	4.9V	0V	4.9V		4.9V	3.7V	0.3V	4.1V

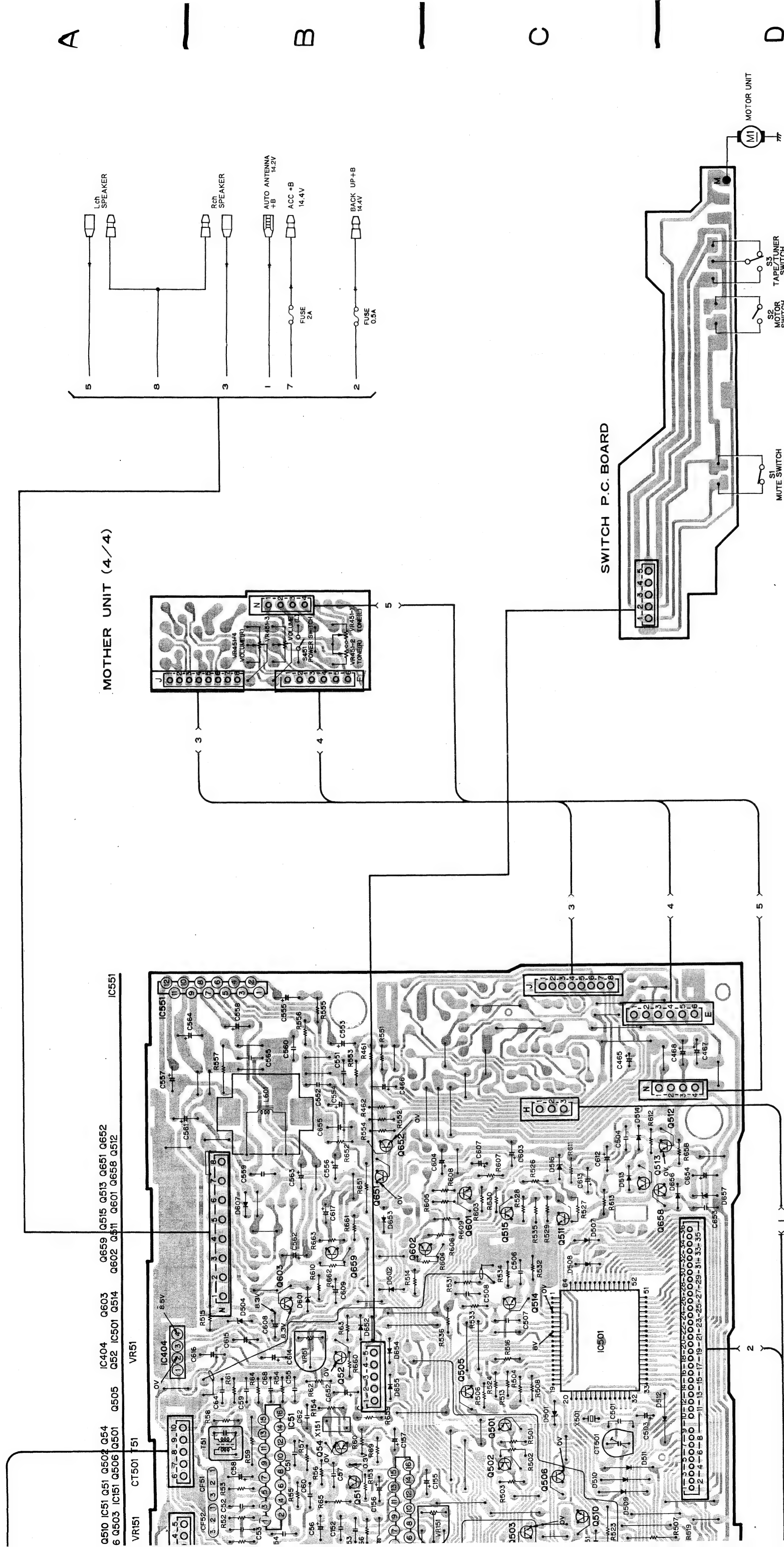


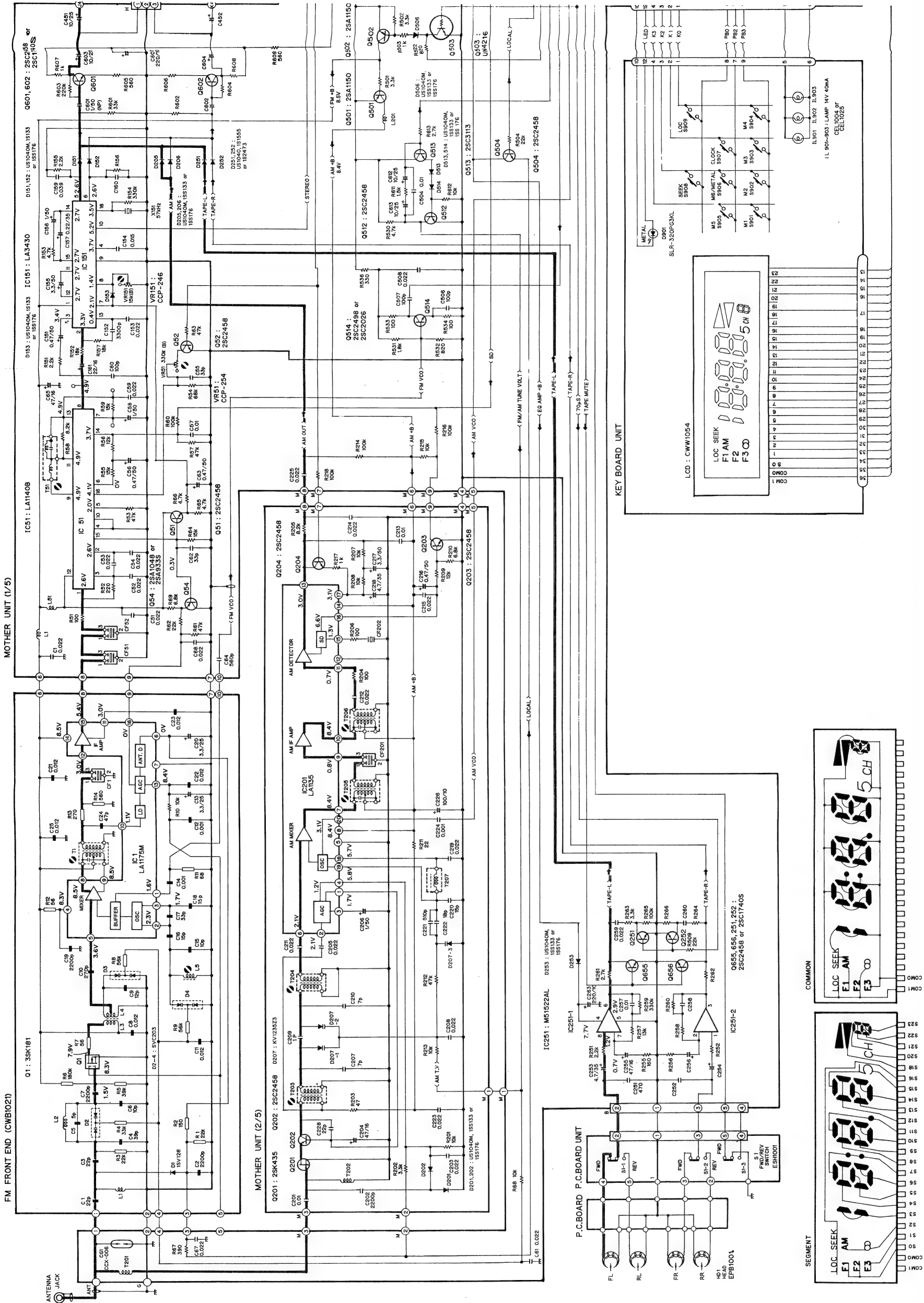
Fig. 27

MOTHER UNIT (1/4) IC151

1	2	3	4	5	6	7	8
3.3V	3.4V	3.7V	2.6V	2.6V	2.1V	1.4V	
9	10	11	12	13	14	15	16
0V	5.2V	2.7V	2.7V	0.4V	2.7V	2.7V	3.5V

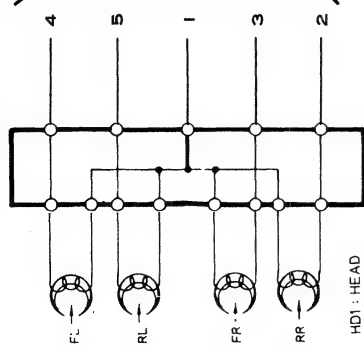
7	8
4.9V	
15	16
0.3V	4.1V

16. SCHEMATIC CIRCUIT DIAGRAM (KE-3232/ES)

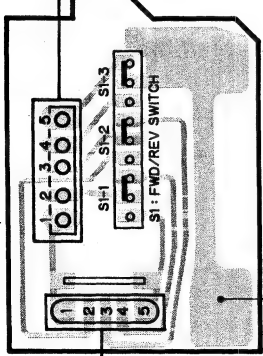


17. CONNECTION DIAGRAM (KE-3232/ES)

P.C. BOARD

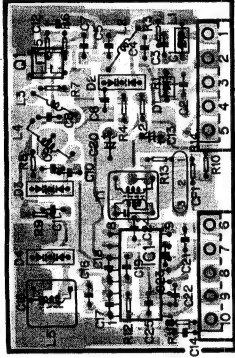


P.C. BOARD UNIT



FM FRONT END (CWBI021)

IC, Q IC1
ADJ L5 T1 Q1



MOTHER UNIT (1/5)

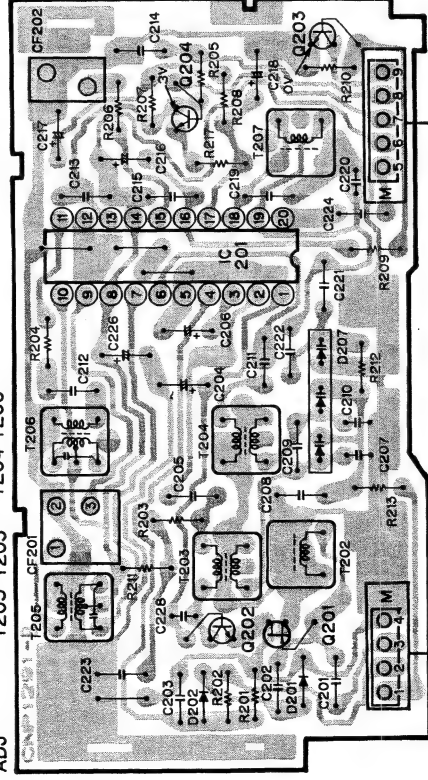
IC251 Q504
IC, Q Q251 Q252
ADJ
Q656 Q655
T201
VR151
IC151 IC51 Q51 Q54
Q509 Q516 Q503 Q506 Q502 Q501 Q505
IC

ANTENNA JACK

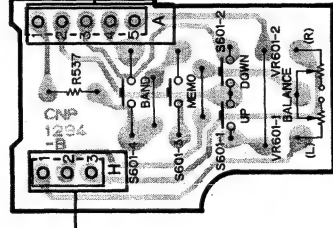


MOTHER UNIT (2/5)

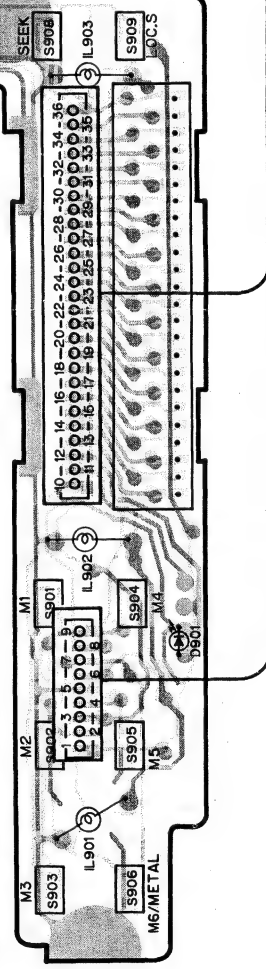
IC, Q Q202 Q201
ADJ
T205 T203 T204 T206
IC201 Q204 Q203



MOTHER UNIT (3/5)



KEY BOARD UNIT (5/5)



MOTHER UNIT (2/5) IC201

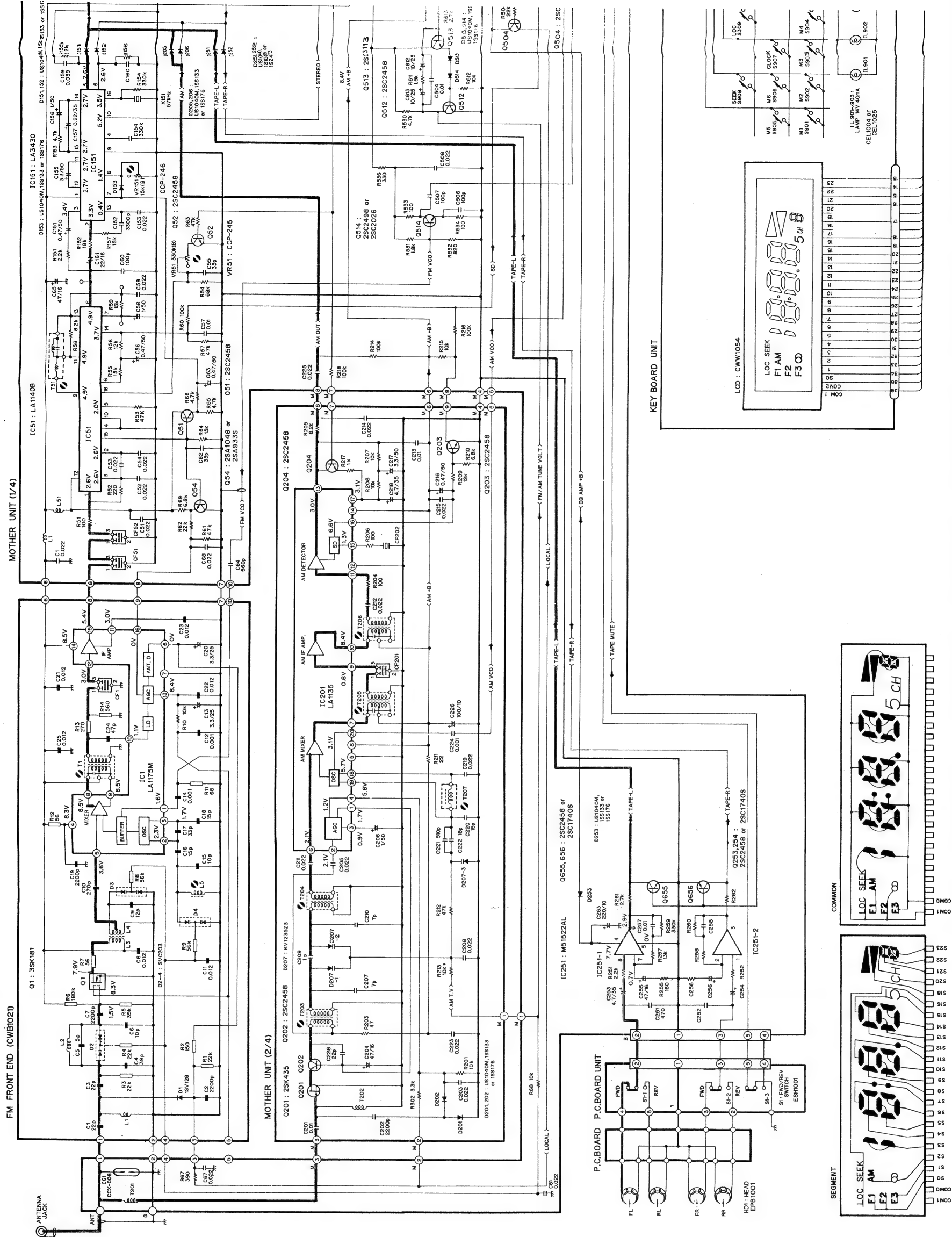
1	2	3	4	5	6	7	8	9	10
1.7V	2.1V	1.2V	OV	2.1V	8.4V	8.4V	0.8V	8.4V	8.4V
11	12	13	14	15	16	17	18	19	20
0.7V	OV	3.0V		1.3V	6.6V	3.1V	5.7V	5.8V	3.1V

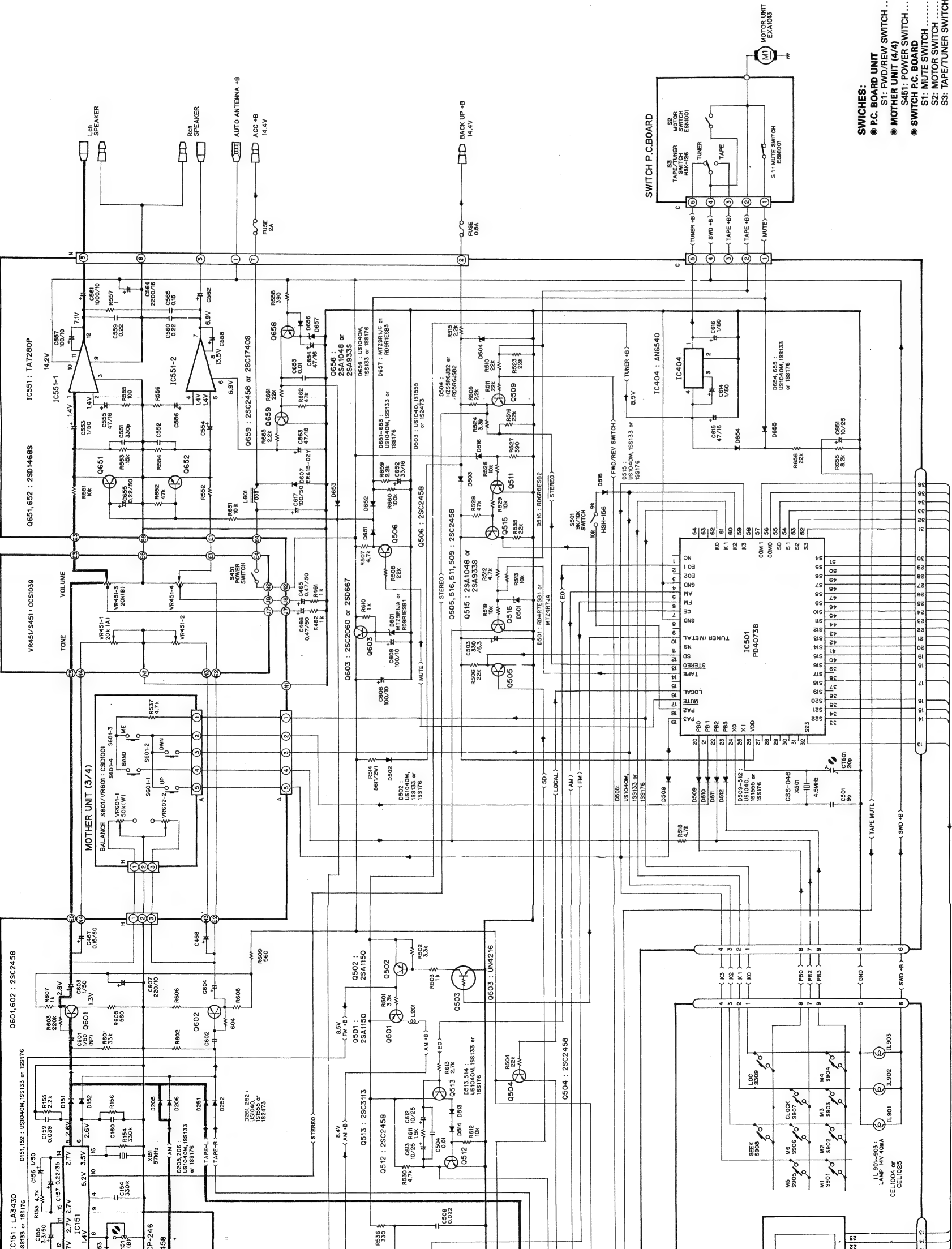
MOTHER UNIT (1/5) IC51

1	2	3	4	5	6	7	8
2.6V	2.6V		OV	2.0V	OV		4.9V
9	10	11	12	13	14	15	16
4.9V	OV	4.9V		4.9V	3.7V	0.3V	4.1V

\angle

18. SCHEMATIC CIRCUIT DIAGRAM (KE-2222/ES)

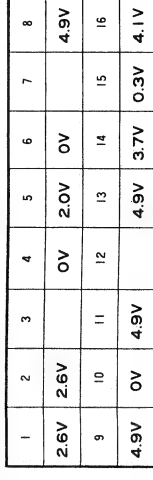




- SWITCHES:**
- P.C. BOARD UNIT
S1: FWD/REV SWITCH FWD—REV
 - MOTHER UNIT (4/4)
S451: POWER SWITCH ON—OFF
 - SWITCH P.C. BOARD
S1: MUTE SWITCH ON—OFF
S2: MOTOR SWITCH ON—OFF
S3: TAPE/TUNER SWITCH TUNER—TAPE

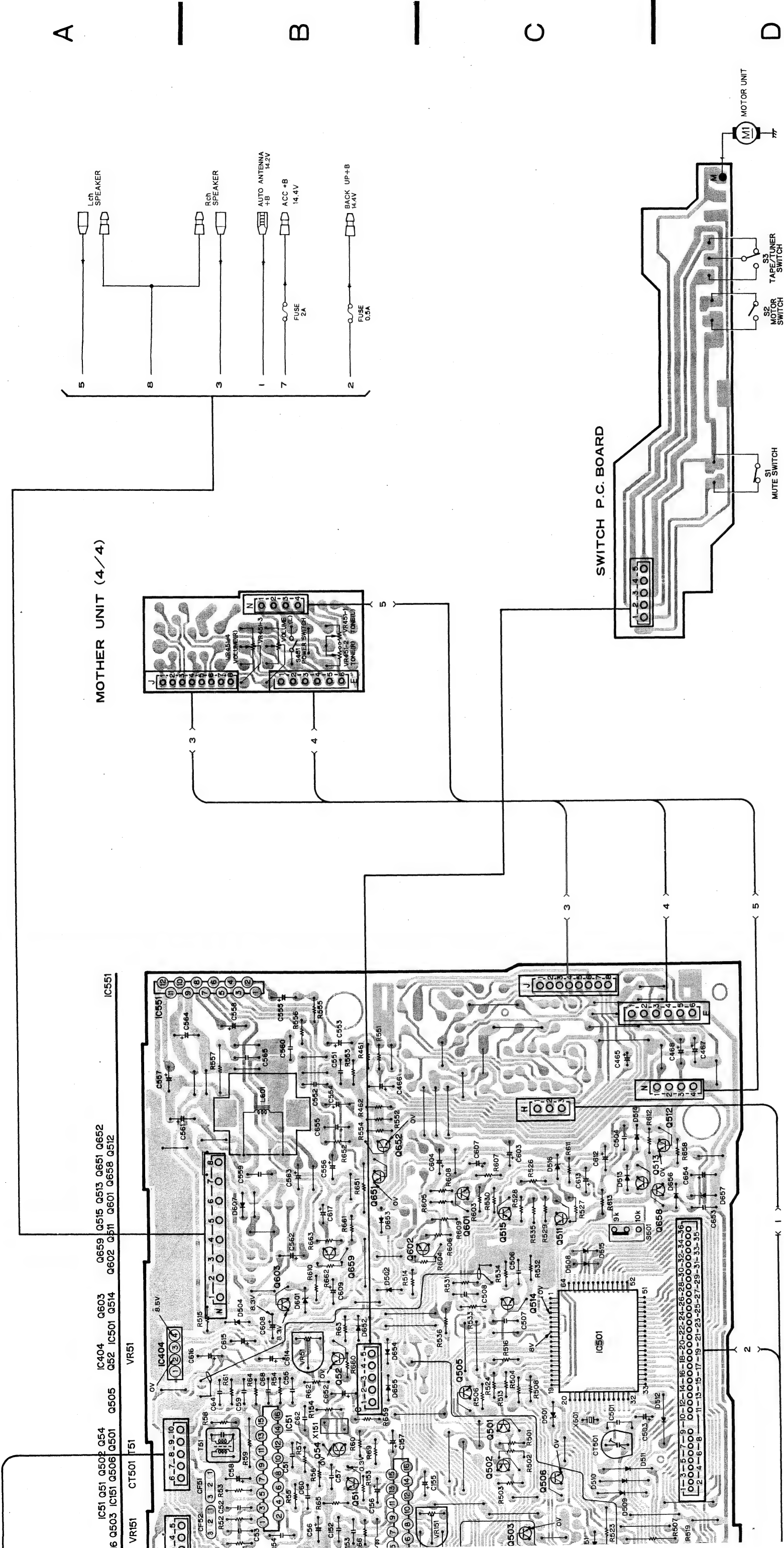
The underlined indicates the switch position.

Fig. 30



	1	2	3	4	5	6	7	8	9	10
1.7V	2.1V			1.2V	0V	2.1V	8.4V	8.4V	0.8V	8.4V
11	12	13	14	15	16	17	18	19	20	
0.7V	0V	3.0V			1.3V	6.6V	3.1V	5.7V	5.8V	3.1V

	1	2	3	4	5	6	7	8
	2.6V	2.6V		0V	2.0V	0V		4.9V
	9	10	11	12	13	14	15	16
	4.9V	0V	4.9V		4.9V	3.7V	0.2V	4.1V



7	8
	4.9V
15	16
1	0.3V 4.1V

MOTHER UNIT (1/4) IC151

1	2	3	4	5	6	7	8
	3.3V	3.4V	3.7V	2.6V	2.6V	2.1V	1.4V
9	10	11	12	13	14	15	16
0V	5.2V	2.7V	2.7V	0.4V	2.7V	2.7V	3.5V

Fig. 31

20. EXPLODED VIEW

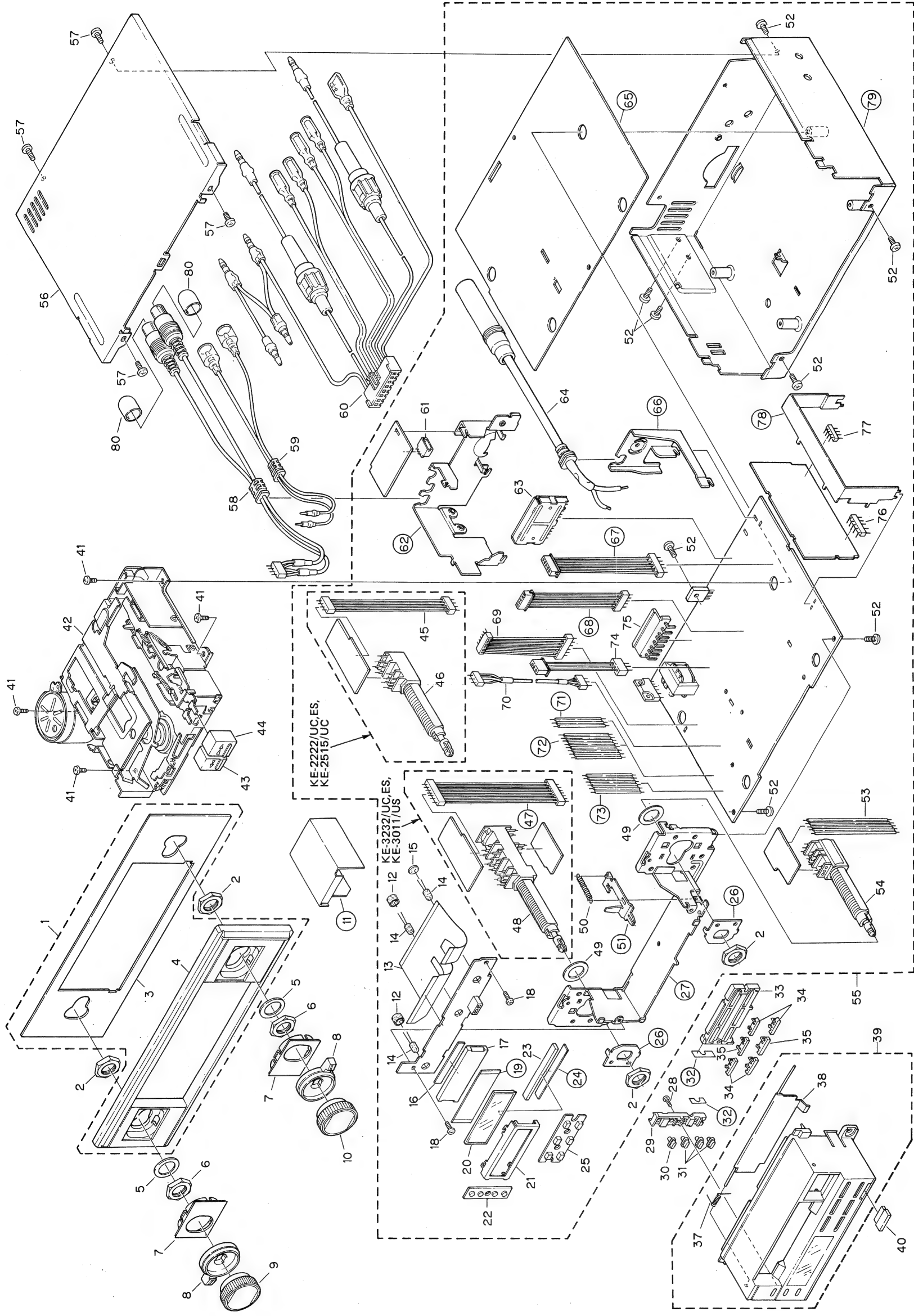


Fig. 32

● Parts List

NOTE:

- **For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.**
- **★★: GENERALLY MOVES FASTER THAN ★.**
- **This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.**
- **Parts whose parts numbers are omitted are subject to being not supplied.**
- **Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.**

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	CXA1629 CXA1631	Panel Assy (KE-3232/UC, ES) Panel Assy (KE-2222/UC, ES, 2515/US)		39.	CXA1583 CXA1584 CXA1585 CXA1586	Grille Unit (KE-3232/UC, ES) Grille Unit (KE-2222/UC, ES) Grille Unit (KE-3011/US) Grille Unit (KE-2515/US)
	2.	CXA1642	Panel Assy (KE-3011/US)				
	3.	CBN-028	Nut		★ 40.	CAC1278	Button (KE-3232/UC, ES, 2222/UC, ES, 2515/US)
	4.	CNG-633	Plate				Button (KE-3011/US)
		CNS1226	Panel (KE-3232/UC, ES)			CAC1354	Cassette Mechanism Assy
	5.	CNS1228	Panel (KE-2222/UC, ES, 2515/US)	●	41.	BMZ26P050FMC	Button (KE-3232/UC, ES, 2222/UC, ES, 2515/US)
		CNS1233	Panel (KE-3011/US)		42.	EXK1130	Button (KE-3011/US)
		CND-646	Spacer (KE-3232/UC, ES, 2222/UC, ES, 2515/US)	★	43.	CAC1277	Button (KE-3232/UC, ES, 2222/UC, ES, 2515/US)
	6.	CNC1528	Spacer (KE-3011/US)		★	CAC1330	Button (KE-3011/US)
		CBN-028	Nut (KE-3232/UC, ES, 2222/ UC, ES, 2515/US)			CAC1276	Button (KE-3232/UC, ES, 2222/UC, ES, 2515/US)
	7.	CBN1001	Nut (KE-3011/US)		44.	CAC1329	Button (KE-3011/US)
		CBK-292	Cap (KE-3232/UC, ES, 2222/ UC, ES, 2515/US)		45.	CDF-637	Connector (KE-2222/UC, ES, 2515/US)
★	8.	CAA1054	Knob (KE-3232/UC, ES, 2222/ UC, ES)	★	46.	CCS1039	Volume/switch (KE-2222/UC, ES, 2515/US)
		CAA1058	Knob (KE-2515/US)		47.		Connectr (KE-3232/UC, ES, 3011/US)
★	9.	CAA1083 CAA1011	Knob (KE-3011/US) Knob (KE-3232/UC, ES, 2222/ UC, ES, 2515/US)	★	48.	CCS1038	Volume/switch (KE-3232/UC, ES, 3011/US)
★	10.	CAA-603 CAA1055	Knob (KE-3011/US) Knob (KE-3232/UC, ES, 2222/ UC, ES, 2515/US)		49.	CBE-084	Spacer
		CAA1056	Knob (KE-3011/US)		50.	CBH1084	Spring
11.	12.	CNV1088	Insulator		51.		Lever
		CNV1370	Bush (UC, ES, 2515/US)		52.	BMZ30P060FMC	Screw
13.		CNP1296	P.C. Board	★	53.	CDE1409	Connector
★	14.	CEL1004 or CEL1025	Lamp, 14V 40mA	●	54.	CSD1001	Volume/switch
	15.	CNV1102	Bush (KE-3232/UC, ES, 2222/ UC, ES, 2515/US)		55.	CWM1246 CWM1248 CWM1249 CWM1250 CWM1251	Tuner Amp Assy (KE-3232/UC) Tuner Amp Assy (KE-3232/ES) Tuner Amp Assy (KE-2222/UC) Tuner Amp Assy (KE-2222/ES) Tuner Amp Assy (KE-3011/US)
		CNV1371	Bush (KE-3232/UC, ES, 2222/ UC, ES, 2515/US)			CWM1252	Tuner Amp Assy (KE-2515/US)
16.	17.	CNN-137	Spacer		56.	BMZ30P040FMC	Case
17.	18.	CNY-215	Lens		57.	CDE1126	Screw
		PMZ20P050FMC	Screw		58.	CDE1381	Connector (KE-3232/UC, ES) Cord (KE-3232/UC, ES)
19.		FTZ-6251H	Plate		59.	CDE1345	Cord Assy (KE-2222/UC, ES, 2515/US)
★	20.	CWW1054	LCD (KE-3011/US)		60.	CDE1419	Cord Assy (KE-3232/UC, ES, 3011/US)
		CNH-136	Holder			CKS-469	Plug (KE-3232/UC, ES)
21.	22.	CNV1375	Rubber		61.		Heat Sink
23.		CNY-214	Connector		62.	CWB1021	FM Front End
	24.	CNV1299	Insulator		63.	CDH1054	Antenna Cable
25.	26.		Rubber		64.		Holder
27.		PTZ14P045FZK	Holder		65.		Insulator
28.			Frame Unit		66.		Connector (5P)
		CNV1298	Lens		67.	CDE1412	Connector (5P)
★	29.	CAC1281	Button (KE-3011/US)		68.		Connector (6P)
★	30.	CAC1281	Button (KE-3011/US)			CDK-206	Connector (3P)
★	31.	CNV1297	Lens		70.		Connector (3P)
	32.		Button (KE-3232/UC, ES, 2222/UC, ES, 2515/US)		71.		Connector (3P)
★	33.	CAC1279	Button (KE-3232/UC, ES, 2222/UC, ES, 2515/US)		72.		Connector (8P)
		CAC1280	Button (KE-3011/US)			CDE1410	Connector (6P)
★	35.		Button (KE-3232/UC, ES, 2222/UC, ES, 2515/US)		73.		Connector (3P)
		CAC1405	Button (KE-3011/US)		74.		Connector (3P)
36.		VACANT	Button (KE-3232/UC, ES, 2222/UC, ES, 2515/US)		75.	CKS-465	Plug (8P)
37.		CBH1033	Button (KE-3011/US)		76.	CKS-128	Plug (5P)
38.		CAT1042	Button (KE-3011/US)		77.	CKS-127	Plug (4P)
		CAT1043	Spring		78.		Holder
		CAT1046	Door (KE-3232/UC, ES, 2222/ UC, ES)		79.		Chassis Unit
			Door (KE-2515/US)		80.	CNW-829	Cap (KE-3232/UC, ES)

21. CASSETTE MECHANISM ASSY EXPLODED VIEW

● Parts List

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
★ ★	1.	EXA1013	Motor Assy	★ ★	59.	BMZ20P040FMC	Screw
	2,3.	VACANT	Screw Holder Spring		60.	EPB1001	Head
	4.	BMZ20P025FMC			61.	CBH-198	Spring
	5.	EBH1011			62.	ENP1003	P. C. Board
	6.				63.	Arm	
	7.	CBF-166	Washer Reel Unit Screw Bracket		64.	EXA1004	Head Base Unit
	8.	EXA1012			65.	EBH1004	Spring
	9.	BMZZ23P030FMC			66.	EBH1003	Spring
	10.	BSZZ23P040FMC			67.	67.	Cushion
	11.	20-22.	VACANT		68.	YE20FUC	Washer
	23.				YE15FUC		
12.	PMS26P025FUC	Screw Cassette Holder Spring Screw Collar	69.	EXA1002	Roller Unit		
13.	EBH1019		70.	EBF1004	Chassis Unit		
14.			71.	EBF1004	Washer		
15.			EBA1002	72.	ENV1009	Pulley	
16.	ELA1019	Arm Washer Washer	73.	73.	Lever		
17.	ENV1022		74.	EBH1025	Spring		
18.	ENV1021		75.	EBL1001	Spring		
19.	YE12FUC		76.	ENV1010	Pulley		
20-22.	VACANT	Washer	77.	77.	Arm		
23.			YE15FUC	78.	HBA-147	Screw	
24.	CBH-165	Washer	79.	ENV1015	Gear		
25.	EBH1035	Spring	80.	ELA1018	Collar		
26.	EBH1037	Arm	81.	81.	Arm		
27.		Spring	82.	82.	Plug		
28.	EBH1039	Spring	83.	83.	Gear		
29.	EBH1010	Arm	84.	84.	Arm		
30.		Arm	85.	EBH1024	Spring		
31.		Spring	86.	86.	Ratchet		
32.		Arm	87.	EBH1018	Spring		
33.	EBH1008	Spring	88.	EXA1003	Roller Unit		
34.	CBG1001	Arm Unit	89.	89.	Arm		
35.		Washer	90.	90.	Lever		
36.		HBH-179	91.	EBH1013	Spring		
37.		ENV1019	92.	EXA1006	Arm Unit		
38.	ENV1020	Flywheel (N)	93.	EXA1020	Gear unit		
★ ★	39.	CNT-091	Flywheel (R)	94.	ELA1032	Collar	
	40.	PMS20P040FMC	Belt	95.	HBA-212	Screw	
	41.		Roller	96.	EBH1007	Spring	
	42.		Cassette Frame Unit	97.	EBH1006	Spring	
	43.		Screw	98.	EBH1014	Spring	
	★ ★	44.	ENV1016	Tape Guide	99.	CBF1001	Washer
		45.	EBH1020	Spring	100.	100.	Arm Unit
		46.	EBH1040	Lever	101.	ENV1018	Gear
		47.		Arm	102.	ENV1017	Gear
		48.	EBH1041	Spring	103.	EBH1022	Spring
		49.	EBH1021	Spring	104.	EXA1005	Arm Unit
50.		EBE1001	Lever	105.	105.	Plug	
51.			Washer	106.	EBA1006	Screw	
52.			EBH1009	107.	BMZ20P070FUC	Screw	
53.			ENT1002	108.	108.	Bracket Unit	
54.		ENV1012	Gear	109.	EBH1016	Spring	
55.	CBH-135	Washer	110.	110.	Lever Unit		
56.	ENV1014	Gear	111.	EBH1017	Spring		
57.	EBA1007	Cover	112.	EBH1005	Spring		
58.		Screw	113.	113.	Lever		
			114.	114.	Lever		
			115.	115.	Arm		

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• Cassette Mechanism Assy

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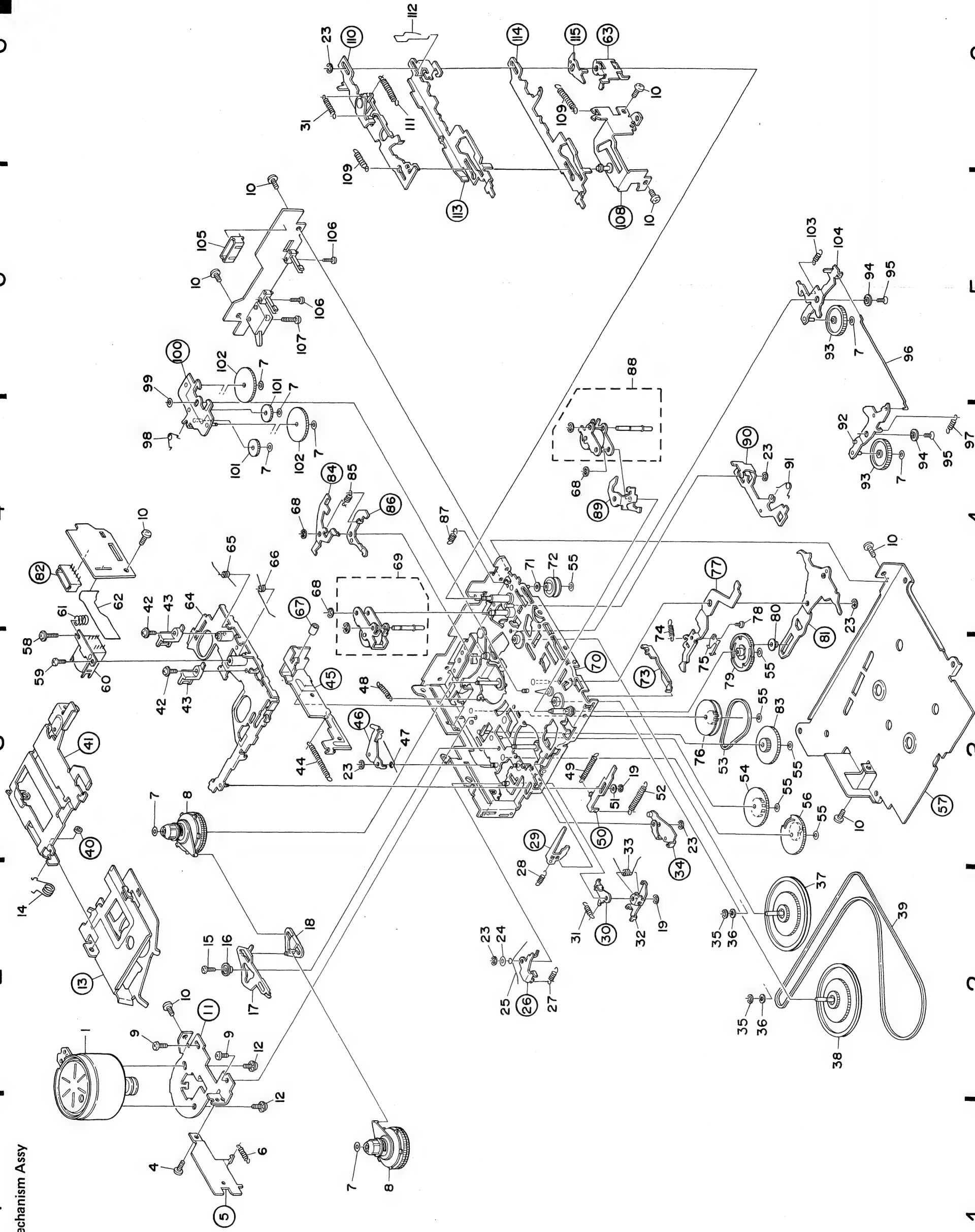
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Fig. 33

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RESISTORS (KE-2222/UC, ES)

Mark	Symbol & Description	Part No.	Mark	Symbol & Description	Part No.
	R51 – 58, 60 – 69, 151 – 157, 201 – 218, 251, 252, 255 – 262, 461, 462, 501 – 506, 508 – 516, 518, 519, 524 – 537, 551 – 556, 601 – 613, 652, 655, 658 – 663	RD1/4PS□□□JL			
	R59, 523, 557, 561, 656	RD1/4PM□□□J			
	R507 (KE-2222/ES)	RD1/4PM□□□J			
					C222 CCRH180J50
					C224 CKPYB102K50L
					C226 CEA101M10L2
					C228 CDSL220J50L
					C251, 252 CKPYB471K50L
					C253, 254 CEANL4R7M35LL
					C255, 256 CEA470M16LS
					C257, 258 CGCYX103K25
					C259, 260 CGCYX223K25
					C261, 262 (KE-2515/US) CGCYX103K25
					C263 CEA221M10L2
					C465 CEAR47M50L2
					C466 CEAR47M50LS2
					C467, 468 CEAR15M50LS2
					C501 CCCCH090D50
					C503 CEA331M6R3L2
					C504, 653 CGCYX103LK25
					C506, 507 CKPYB101K50L
					C508 CKDBC223K25
					C551, 552 CKDYB331K50
					C553, 554 CEA010M50LS2
					C555, 556, 563 CEA470M16L2
					C557, 558 CEA101M10L2
					C559, 560 CQMA224J50L
					C561, 562 CEA102M10L2
					C564 CEA222M16L2
					C565 CQMA154J50L
					C601, 602 CEA010M50NPLL
					C603, 604 CEA010M50LS2
					C607 CEA221M10L2
					C608, 609 CEA101M10L2
					C612, 613 CEA100M25LS
					C615 CEA470M16L2
					C617 CEA101M50L2
					C651 CEA100M25LS
					C652 CEA330M16LS
					C654 CEA470M16LS
					C655 CEAR22M50LS2

RESISTORS (KE-2515/US)

Mark	Symbol & Description	Part No.
	R51 – 58, 60 – 69, 151 – 157, 201 – 218, 251, 252, 255 – 262, 267 – 270, 461, 462, 501 – 506, 508 – 520, 524 – 537, 551 – 556, 601 – 613, 642, 655, 658 – 663	RD1/4PS□□□JL
	R59, 523, 557, 651, 656	RD1/4PM□□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C1, 51 – 54, 59, 67, 68, 153, 203	CGCYX223K25
	C55, 62	CCCSL330J50
	C56, 63, 151, 216	CEAR47M50LS2
	C57, 201, 213	CGCYX103K25
	C58, 156, 616	CEA010M50LS2
	C60	CKPYB101K50L
	C61	CGCYX223K25
	C64	CKCYB561K50
	C65, 204	CEA470M16L2
	C152	CGCYX332K25
	C154	CKDBC153K25
	C155	CEA3R3M50LS
	C157	CSZAR22M35
	C159, 160	CKDBC393K25
	C161	CEA220M16L2
	C202	CGCYX222K25
	C205, 208, 211, 212, 214, 215, 219, 223, 225	CGCYX223K25
	C206, 614	
	C207, 210	CEA010M50LS2
		CCDSH070C50L
	C209	CCPCH010M50L
	C217	CEA3R3M50L2
	C218	CEA4R7M35L2
	C220	CCDCH150J50L
	C221	CQPA511G2A

KEY BOARD UNIT (KE-3232/UC, ES, 3011/US)

Mark	Symbol & Description	Part No.	Mark	Symbol & Description	Part No.
★	LCD (KE-3232/UC, ES)	CWW1054	★ ★	S1, 2	Switch (MUTE, MOTOR) ESN1001
★	LCD (KE-3011/US)	FTD-6251H	★ ★	S3	Switch (TAPE/TUNER) HSK-126
★	D901 LED (METAL)	SLR-320PG3KL			
★ ★	IL901 — 903 Lamp, 14V 40mA	CEL1004 or CEL1025			

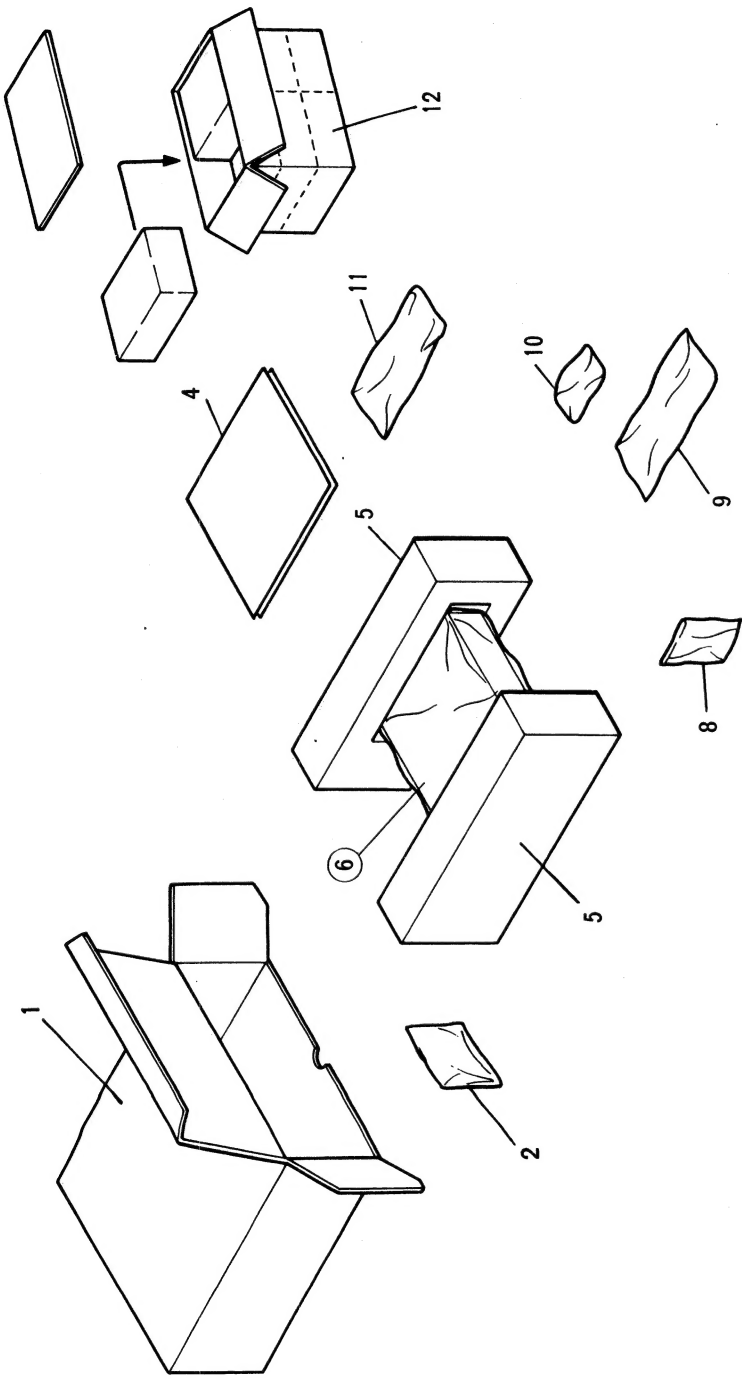
KEY BOARD UNIT (KE-2222/UC, ES, 2515/US)

Mark	Symbol & Description	Part No.	Mark	Symbol & Description	Part No.
★	LCD	CWW1054	★ ★	S1	Switch (FWD/REV) ESH1001
★	D902 (KE-2515/US)	SLR-320VR3FKL			
★ ★	IL901 — 903 Lamp, 14V 40mA	CEL1004 or CEL1025			

Miscellaneous Parts List

Mark	Symbol & Description	Part No.
★ ★	HD1	EPB1001
★ ★	M1	EXA1013
	Head	
	Motor	

23. PACKING METHOD



● Parts List

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	CHG1270	Carton (KE-3232/UC)	★	2-8	CAA1058	Knob (KE-2515/US)
		CHG1273	Carton (KE-3232/ES)		3.	VACANT	
		CHG1274	Carton (KE-3011/US)		4.	CRB1068	Owner's Manual (KE-3011/US)
		CHG1275	Carton (KE-2222/UC)			CRB1069	Owner's Manual (KE-2515/US)
		CHG1278	Carton (KE-2222/ES)			CRD1080	Owner's Manual (KE-3232/ES, 2222/ES)
		CHG1279	Carton (KE-2515/US)				
	2.	CXA1634	Knob Assy (KE-2222/UC, ES)			CRD1124	Owner's Manual (KE-3232/UC, 2222/UC)
		CXA1636	Knob Assy (KE-3011/US)				Styrofoam
		CXA1637	Knob Assy (KE-2515/US)		5.	CHP1064	Polyethylene Bag
		CXA1773	Knob Assy (KE-3232/UC, ES)		6.		
★	2-1.	CAA1011	Knob (KE-3232/UC, ES, 2222/UC, ES, 2515/US)		7.	VACANT	
★	2-2.	CAA1054	Knob (KE-3232/UC, ES, 2222/UC, ES, 2515/US)				Cover
★	2-3.	CAA1055	Knob (KE-3232/UC, ES, 2222/UC, ES)		8.	CNS-962	Accessory Kit (KE-3232/UC, ES, 2222/UC, ES, 2515/US)
					9.	CEA-550	Accessory Kit (KE-3011/US)
					9-1.	CEA1196	Cord
						CDE1289	
	2-4.	CNK-292	Cap (KE-3232/UC, ES, 2222/UC, ES, 2515/US)		9-2.	CNV-769	Washer
★	2-5.	CAA-603	Knob (KE-3011/US)		9-3.	CNS-722	Cover
★	2-6.	CAA1056	Knob (KE-3011/US)		9-4.	CNC-975	Strap
★	2-7.	CAA1083	Knob (KE-3011/US)		9-5.		Screw Kit
					9-5-1.	CBA-028	Screw for strap

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	9-5-2.	CBN-028	Nut		11.	CXA1629	Panel Assy (KE-3232/UC, ES)
	9-5-3.	B20-013	Washer (KE-3011/US)			CXA1631	Panel Assy (KE-2222/UC, ES, 2515/US)
	9-5-4.	CND-646	Spacer (KE-3232/UC, ES, 2222/UC, ES, 2515/US)			CXA1642	Panel Assy (KE-3011/US)
	9-5-5.	NF40FMC	Nut (KE-3232/UC, ES, 2222/UC, ES, 2515/US)		11-1.	CNS1226	Panel (KE-3232/UC, ES)
	9-5-6.	NF50FMC	Nut (KE-3232/UC, ES, 2222/UC, ES, 2515/US)		11-2.	CNS1228	Panel (KE-2222/UC, ES, 2515/US)
	9-5-7.	CBN1001	Nut (KE-3011/US)		11-3.	CNS1233	Panel (KE-3011/US)
	9-5-8.	CNC1528	Spacer (KE-3011/US)		11-4.	CNG-633	Plate
	9-5-9.	WS40FMC	Washer (KE-3232/US, ES, 2222/UC, ES, 2515/US)		12.	CHL1270	Contain Box (KE-3232/UC)
	9-5-10.	PMB50Y160FMC				CHL1274	Contain Box (KE-3011/US)
	10.	CDE1345	Cord Assy (KE-2222/UC, ES, 2515/US)			CHL1275	Contain Box (KE-2222/UC)
		CDE1419	Cord Assy (KE-3232/UC, ES, 3011/US)			CHL1279	Contain Box (KE-2515/US)